OCTOBER 1956

GAS

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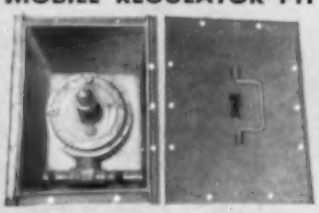

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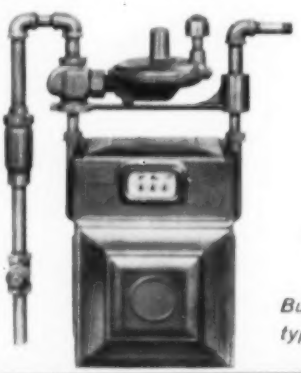

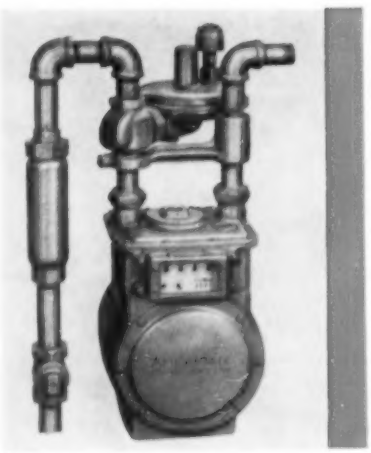

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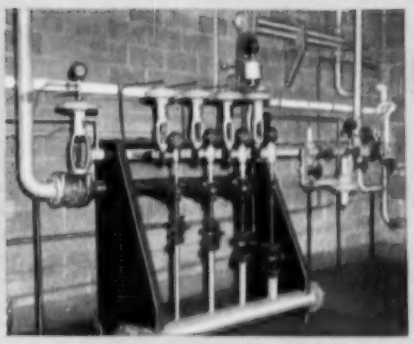

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BPA

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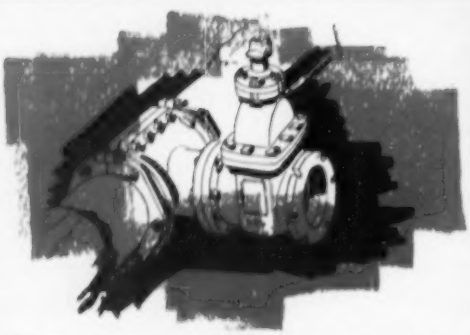

STEP 1: Attach. Clean main. Place tapping sleeve or cross in position and fasten securely to main. Tighten mechanical joints. Attach gate valve or extension stopper fitting.

STEP 2: Mount. Mount "CC" or power operated "C-1" drilling machine on valve (in open position) with proper shell cutter and adapter.

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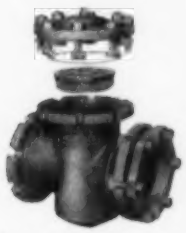
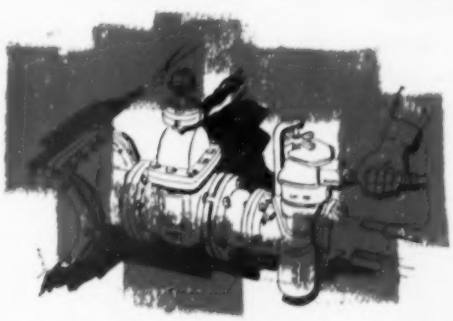
Tapping valve with "O" ring stem seals has similar construction to Mueller non-rising stem gate valves. Seat opening in tapping valve is larger than nominal size to permit making full diameter cut. Valve sizes 2" through 12".

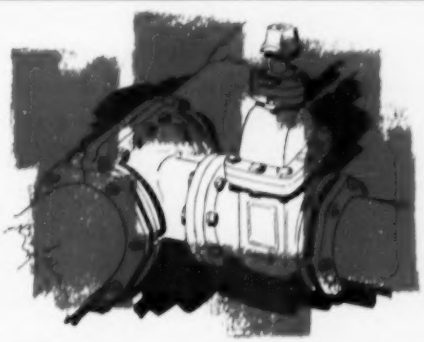


Extension Stopper Fitting

If desired, an extension stopper fitting may be used in place of the tapping valve on 4", 6" and 8" sizes. After cut in main is completed, fitting is stopped off in conventional manner, permitting removal of drilling machine and attachment of lateral.



STEP 3: Drill. Advance boring bar until pilot drill strikes main – retract two turns – set automatic feed at zero and engage. Make cut. Retract boring bar.



STEP 4: Complete. Close valve (or insert stopper) and remove drilling machine. Attach lateral to outlet of tapping valve or stopper fitting and open valve. Lateral is now complete.

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GAS Thermally Thinking

Gas industry affected by the Suez crisis?

THE warnings about Middle-East oil imports that TIPRO, IPAA, and 18 other associations of independents have been blasting about for years, have been given new attention as Egypt's President Nasser threatens to cut off oil—and all other —shipments through the Suez Canal.

And how does this affect the gas industry?

First, the Suez muddle jolted Office of Defense Mobilization into reviews of several industries. ODM's job is to assure industrial preparation for a "next" war. In line with this, fast tax amortization came into the restudy program. Expansion Goal No. 171 deals with the gas utility companies. It has been closed for over a year, but Neil Regeimbal, GAS' Washington man, reports it may be restudied about Jan 1.

Second, steel expansion goals have been closed, but ODM is currently studying needs for plate, structural, and tubular goods for defense. The result thereof might be new rolling mills to eventually ease tight supply of line pipe and other pipe for gas industry applications, and tubular products for gas- and oil-patch needs. Prices might be eased, too.

Third, oil prices will probably be upped. Middle-East oil is cheap if the costs of maintaining the military required to protect its flow to the U. S. are ignored. Shipping costs for tanker-carried petroleum from the Persian Gulf—and even from the Caribbean—jumped sharply as early as late August. The effects of these factors to the gas industry are obvious.

Washington observers feel that the Suez furor may precipitate development of a national fuel policy. Doubtless, this has claimed the attention of the Cabinet Advisory Committee on Energy Supplies and Resources Policy. We believe the gas industry's responsibilities to this part of the nation's life should, and will, be increased as a direct result of Nasser trying to make himself a hero in the eyes of the Arabic world.

J. Fred Ebdon

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GAS highlights

SPOT NEWS, TRENDS, COMMENT ON GAS INDUSTRY AFFAIRS

There has been a definite change in the American way of living. For the first time in our history, gas is the NUMBER 1 fuel for central space heating in homes. Family living and comfort in 10.2 million homes is enhanced by the convenience and economy of gas-fired, central space heating units. The utility companies and heating equipment manufacturers are to be congratulated on this accomplishment. Central gas heating units in domestic installations have about doubled since just 1951. A great sales job. However, there are still 10 million oil-fired central heating units and 7.5 million coal-burning clinkers sitting around in American homes. So, there is no lack of replacement market as more and more natural gas becomes available in all sections of the country.

More and more natural gas is being delivered to all sections of the country except in one spot—the state of Maine. This state has no natural gas and is the only state in the union without it. Interior of Florida still gets along with fuel oil, butane-propane, and electricity, but big plans are just waiting FPC approval to bring natural gas to this hold-out market.

Houston Texas Gas & Oil Corp. and Coastal Transmission Corp. will link physical facilities to serve Florida, if FPC grants certificate. Their lines will join the Rio Grande, Texas gas fields with distribution systems in Orlando, Tampa, St. Petersburg, Miami, and Miami Beach, to name a few. The state's two largest utility companies—Florida Power & Light Co. and Florida Power Co.—have supported the application and signed contracts for natural gas to operate electric generating plants. The Florida Industrial Development Commission, the Florida State Chamber of Commerce, and many other individual chambers are supporting the project. Harold Colee, vice president and general manager of the Florida State Chamber of Commerce, told the FPC that Florida's growth will be "checked, permanently throttled" without the supply of natural gas it is seeking. Hearings resumed Sept 11 in Washington. United Gas Corp., and its pipeline affiliate, serve Escambia county and the westernmost tip of Florida—industry flourishing there makes an attractive example for the rest of Florida.

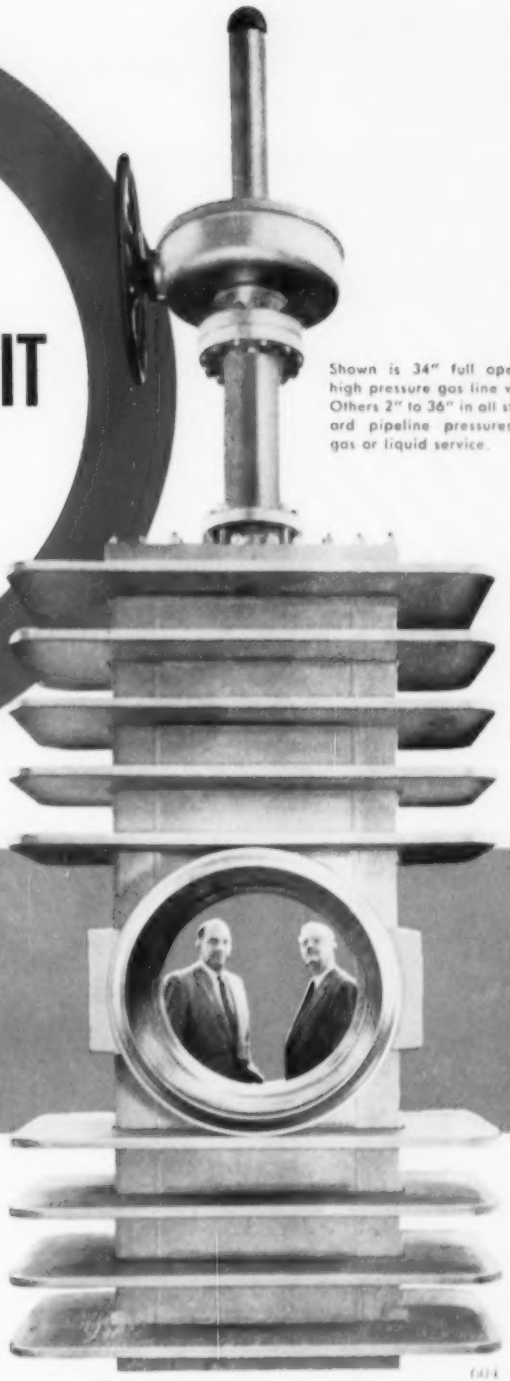
The Internal Revenue Service has eased the threat that tax deductions for lobbying expenses may be illegal. It's a legal expense as long as the organization or association given money makes lobbying a secondary function. Still up in the air, however, are deductions for contributions to organizations that put on "educational" campaigns—such as some of those formed during the recent fight over the Harris-Fulbright natural gas bill.

Coal industry spokesmen are claiming a Defense Department directive ordering all military base commanders to use the "most available" fuel for all types of applications, except cooking, as a victory for John L. and crew. The not-so-confidential CONFIDENTIAL directive applies to all military installations and directs each base to establish a "primary" fuel, i.e., the fuel for which the equipment was originally designed. If conversion can be readily facilitated, that's fine, but a primary fuel must be designated. Primary fuels shall be the most economical, consistent with available supply, the directive states, except that fully automatic type fuels "may be considered" for family housing units, as a convenience. Coal people say this means the top brass are telling the medium brass to knockoff bringing gas into areas where the cost of coal would be cheaper, just because the gas is a lot easier to handle.

OCTOBER 1956 MORE HIGHLIGHTS ON PAGE 120

the gate valve with THROUGH CONDUIT always in line with the line

Shown is 34" full opening high pressure gas line valve. Others 2" to 36" in all standard pipeline pressures for gas or liquid service.



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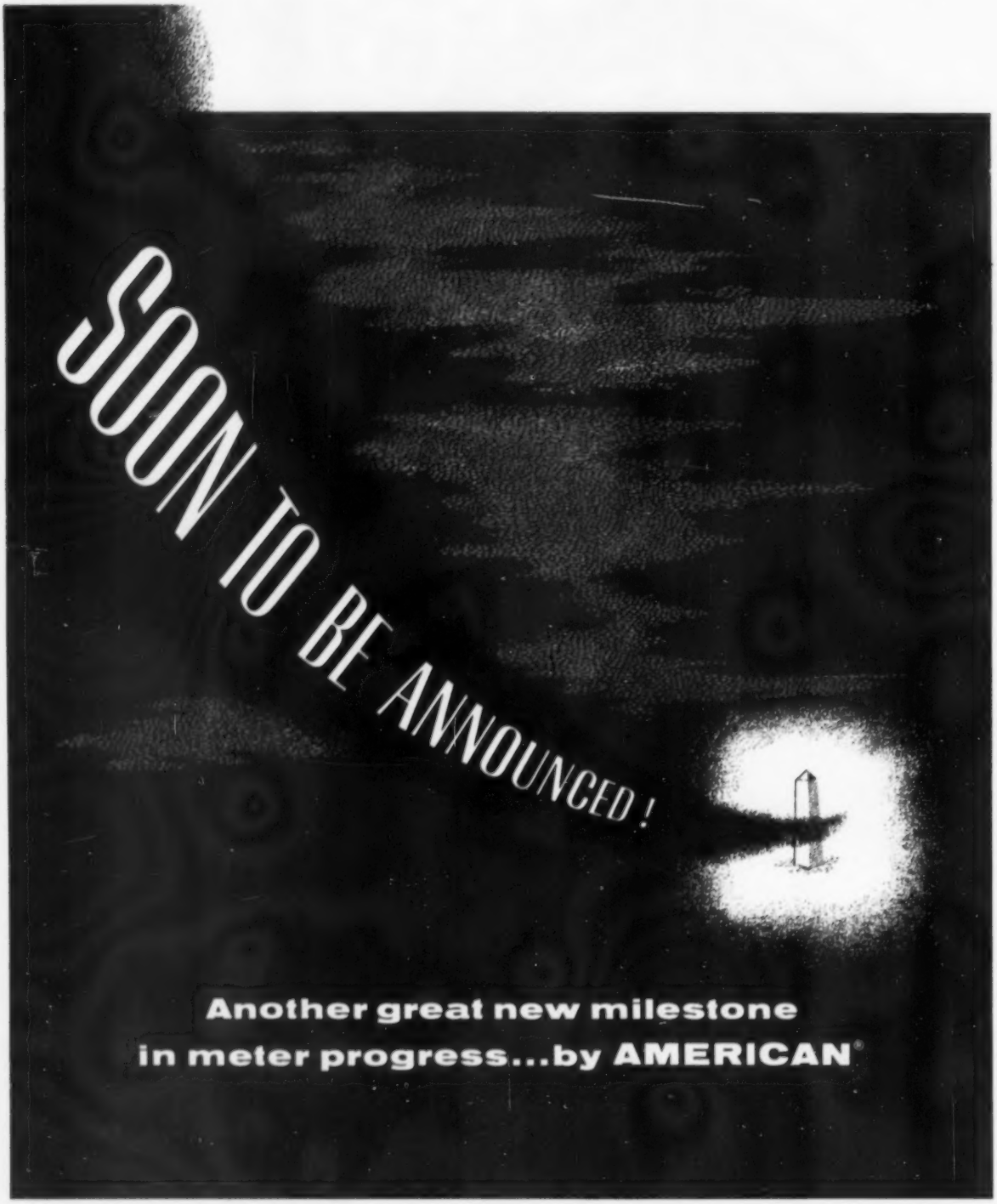

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FPC powerless to compel pipeline enlargements

STOCKHOLDERS of interstate natural gas pipelines and consumers of dependent local distribution companies connected to interstate pipelines will be interested in a recent Federal Power Commission decision. In that case FPC overruled the presiding examiner and decided that it lacked power, under the Natural Gas Act, to compel the enlargement of transportation facilities even to eliminate discrimination between the gas service rendered to different local distribution company customers. This result will surprise the management of many gas distribution companies, because those local public utilities are obligated by state law to enlarge their facilities constantly to meet consumer demands for adequate service and for elimination of discrimination.

FPC described the problem presented thus: ". . . a controversial issue presented in this regard relates to claimed discrimination by Panhandle against certain of its utility customers, and the scope of our authority under the act to take action in this proceeding with respect to such discrimination if it exists. As described earlier, Panhandle seeks authority to enlarge 10 laterals serving 18 utility customers. The Central West Utility Co. (Central West), an intervener in this proceeding and a customer served from another lateral called the Liberty lateral, contends that Panhandle for a long time past has practiced unlawful discrimination against customers whom it serves from the Liberty lateral, as compared to customers served by certain of its other laterals including the 10 which Panhandle seeks authority to enlarge."

FPC overruled the examiner, who found that the interstate pipeline company was granting an undue preference to utilities served by 10 laterals as compared to the two utilities served from the Liberty lateral pipeline. The examiner put a condition on the certificate of public convenience and necessity which required the pipeline company to spend $600,000 to enlarge its facilities to deliver more gas to the local distribution utilities on the Liberty lateral.

The interstate pipeline company appealed to FPC by contending that the examiner was wrong, and that under the Natural Gas Act and court decisions FPC lacked authority to impose such a requirement. FPC agreed and cited Section 7(a) of the Natural Gas Act which declares that "the commission shall have no authority to compel the enlargement of transportation facilities."

Even though FPC has power to attach reasonable conditions to certificates of public convenience and necessity authorizing the construction and operation of interstate pipelines it did not extend that power in this case. Referring to a judicial decision, which FPC concluded was controlling here it said:

"We consider that the decision of the court in the Panhandle case cited above governs this case, and requires the reversal of the examiner on this issue. The circumstances of that decision closely parallel the circumstances of the present case. Both involve the same companies, the same lateral, and the same claimed discrimination; and the requirement we imposed in the earlier case was, in language and effect, practically identical to the requirement which the examiner would impose here. In the earlier case the court held that we have no authority to compel the enlargement of transportation facilities even though the purpose is to eliminate discrimination; and that this prohibition extends to an order whch, although it does not in so many words require a company to enlarge its facilities, in effect compels it to do so. As the court there said . . . :

> . . . . it was beyond the power of the Commission to order Panhandle within 45 days to take steps to eliminate discrimination in the service between the customers on its Liberty lateral and those on its other laterals by enlarging the facilities of the Liberty lateral.

This holding is dispositive of the issue in this proceeding respecting the imposition of a requirement that Panhandle enlarge its facilities on the Liberty lateral. Such a requirement is 'beyond the power of the Commission.'

"Moreover, we consider that the Panhandle case cited above, and the instant one, are not materially distinguishable. In the instant case, it is true that the requirement would be imposed by a condition under Section 7(e) of the Natural Gas Act rather than under Section 5. However, despite the method employed, the effect remains the same —the company would be compelled to enlarge its facilities, contrary to the express declaration of the court quoted above that to require such is 'beyond the power of the Commission.' To impose such a requirement would put us in the position of doing indirectly what we are forbidden to do directly. Familiar

*A monthly commentary on national and state developments by an expert in the field of utility law.

rules of law and our own regard for a proper observance of the limitations which Congress and the courts have placed upon our authority both restrain us from pursuing such a course.

"These same reasons require us to reject the proposition that an order requiring the enlargement of facilities by way of a condition to a certificate authorization would be a permitted exercise of power, since the action taken by the company under such a condition would be 'voluntary,' not 'mandatory.' As we point out later, such a distinction is completely hollow in view of the fact that the condition in question would impose heavy economic pressures upon the company. Furthermore, a 'choice' between the grant of a certificate on condition that the company enlarge certain other transportation facilities, on pain of denial of the certificate authorization if the company refuses to accede to the condition, cannot fairly be called 'voluntary.'

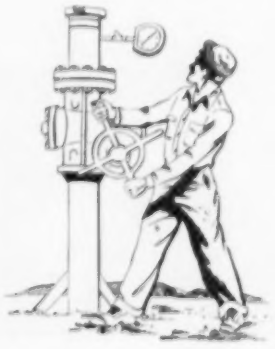
"The rationale of the Panhandle case establishes that our lack of authority to compel the enlargement of facilities by means of a condition to a certificate does not turn upon any such narrow distinctions as the above. It hinges upon a consideration far more basic. The heart of the matter the court stated in the following language . . . :

> . . . . In the light of Section 7(a) we are compelled to conclude that Congress meant to leave the question whether to employ additional capital in the enlargement of its pipeline facilities to the unfettered judgment of the stockholders and directors of each natural gas company involved.

"As the court's language establishes, there is a sphere wherein, under the Act, the judgment of the stockholders and directors of the company has free exercise, and the investment of capital for the purpose of enlarging pipeline facilities comes within that sphere. We can deny the proposed construction of facilities but except to the limited extent the Act permits, we cannot require a company to risk its capital in a venture which in the exercise of its officers' judgment, it considers unwise to undertake. But the effect of the condition imposed by the Examiner's decision would be to compel Panhandle to enlarge the Liberty lateral. Indeed, that is its purpose. Thereby, we would tell Panhandle it may either enlarge all the laterals or none of them. And by specifying the volumes of gas which shall be delivered by the Liberty lateral, we would not only require the investment of capital associated therewith but would define the extent of investment. Obviously, this would take decision on these matters, respecting which it is management's right and obligation to judge, out of management's hands.

"Moreover, the imposition of a condition requiring the company to enlarge the lateral, rather than an express direction to do so, does not render the requirement any the less mandatory. Undeniably, the condition involves coercion which precludes the free exercise of managerial discretion. As the company puts it, 'Either Panhandle must abandon hope of successfully investing to enlarge markets of its own choice, or Panhandle must submit to the obligation of enlarging its facilities to serve markets, which do not, in Panhandle's considered judgment, warrant the investment involved. We cannot but conclude that if Congress had intended that we have a power of such extent and possibly far-reaching impact, the grant of such authority would be confirmed by something more specific than the general and rather standardized 'conditions' provision of Section 7(e).

"It has been argued that the standard of 'public convenience and necessity' is sufficiently broad to permit the Commission to consider matters of discrimination in passing upon whether to grant a proposed authorization, although no judicial decisions have been cited which construe this phrase so broadly and we know of none. In any event, assuming that our authority were held to extend this far, it is logical to assume that the discrimination to be thus considered must be shown to have some reasonable connection or relationship to the particular certificate authorization proposed. And we cannot find that there is such a reasonable relationship or connection between the claimed discrimination on the Liberty lateral and the proposal to enlarge the other ten laterals in this case."



Prior to the FPC decision we have just described, the United States Court of Appeals for the Third Circuit reviewed an FPC order requiring a natural gas pipeline company to deliver more gas to certain utility company customers than its system was designed and built to transport, thereby forcing an enlargement of facilities. The Court reversed FPC and ruled that the Natural Gas Act does not empower FPC to require a natural gas company to increase its pipeline system capacity, even if the pipeline was engaging in discrimination by delivering one group of local distribution company customers a larger proportion of their gas requirements than was delivered to other gas utilities similarly situated.

The Circuit Court of Appeals reasoned that, ". . . the Supreme Court held that under section 1(b) of the Act the Commission has no jurisdiction over the production or gathering of natural gas. It would seem that Congress intended that the proviso of section 7(a) prohibiting the Commission from requiring the enlargement of transportation facilities for natural gas should be complementary to section 1(b). For if the Commission could require a natural gas company to enlarge its transportation facilities for the purpose of delivering more gas through them, the Commission would be effectively regulating the production and gathering of natural gas. Obviously such enlarged transportation facilities could not

Continued on page 121

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Today's more demanding operating conditions wrote the specifications for Alert "80". It has been proved in all types of distribution systems, has met every test by large and small utilities. Alert "80" is a selected and blended group of mercaptans with precision blending and balancing—giving better, full range volatility and stronger initial "punch."

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WASHINGTON

Election results will have major impact on industry

By N. R. REGEIMBAL
GAS Washington Bureau

THE political wheels of government are at a virtual standstill, waiting for the voters to go to the polls in November and pick the men and the party to guide the country over the next stretch. Gas industry officials are anxiously awaiting the election returns.

Outcome of the voting will have a major impact on every segment of the gas industry. Generally, Democrats in power will mean a drift toward more federal control; Republicans in power will mean a trend, probably slow, away from government intervention.

Split control, as has existed for the past two years with the Republicans in command of the White House and the Democrats running Congress, will tend to produce lots of stalemates — many Presidential requests for legislation won't be considered, and the number of Presidential vetoes will rise.

Gas industry segements favoring legislation to override the U. S. Supreme Court and free independent natural gas producers from Federal Power Commission control are pretty well convinced that President Eisenhower will get behind some type of gas bill next year —if he is re-elected. But they tend to believe that it would not be as favorable to them as the ill-fated Harris - Fulbright bill passed by Congress this year and vetoed by the President.

Democratic party interest in gas legislation has been so far lacking, although some leading party members, mostly those from the big gas-producing states, have supported such legislation. Union interests in the party, however, hotly oppose legislation of the Harris-Fulbright type, and the party as a unit seems content to let the issue lie among the "to be decided later" problems.

As far as the gas industry is concerned, reports are that some of the groups interested in ending producer controls held "preliminary talks" this summer, but dropped them to wait and see what the elections will bring before they get down to the serious business of trying to work out a new bill and get it started down the legislative path. Gas distributors who oppose decontrol are sitting tight, waiting to see what the proponents of decontrol come up with. "We're happy the way things are," one proponent of control says.

Democratic leaders in Congress, meanwhile, are sewing the seeds of legislation to amend the depletion allowances. A Senate subcommittee, headed by Sen. James Murray (D., Mont.), is making a "complete" investigation of depletion allowances, especially in the oil and gas industry. Plans are to hold public hearings this fall at which gas industry spokesmen would be given a chance to testify.

Among the questions the subcommittee says it wants answered are how much realism is involved in the present sliding scale of depletion allowances which run from as high as 27.5 per cent for oil and gas (higher than uranium) to 5 per cent for some minerals, and whether granting of large allowances produces a more, or less, complete picture of reserves.

Senator Murray, who hails from a mining state, may be attempting to collect information which will help him get higher depletion allowances for minerals. But attacks on the high oil and gas depletion allowances have been stepping up in the last two years, mostly from Democrats.

One Democratic proposal this year would have cut the oil and gas allowance by 22.5 percentage points, down to 5 per cent, and other allowances to as low as 1 per cent.

Fate of depletion allowances—without which gas prices to many utilities would probably go up, their supporters say—may rest on the outcome of the November voting.

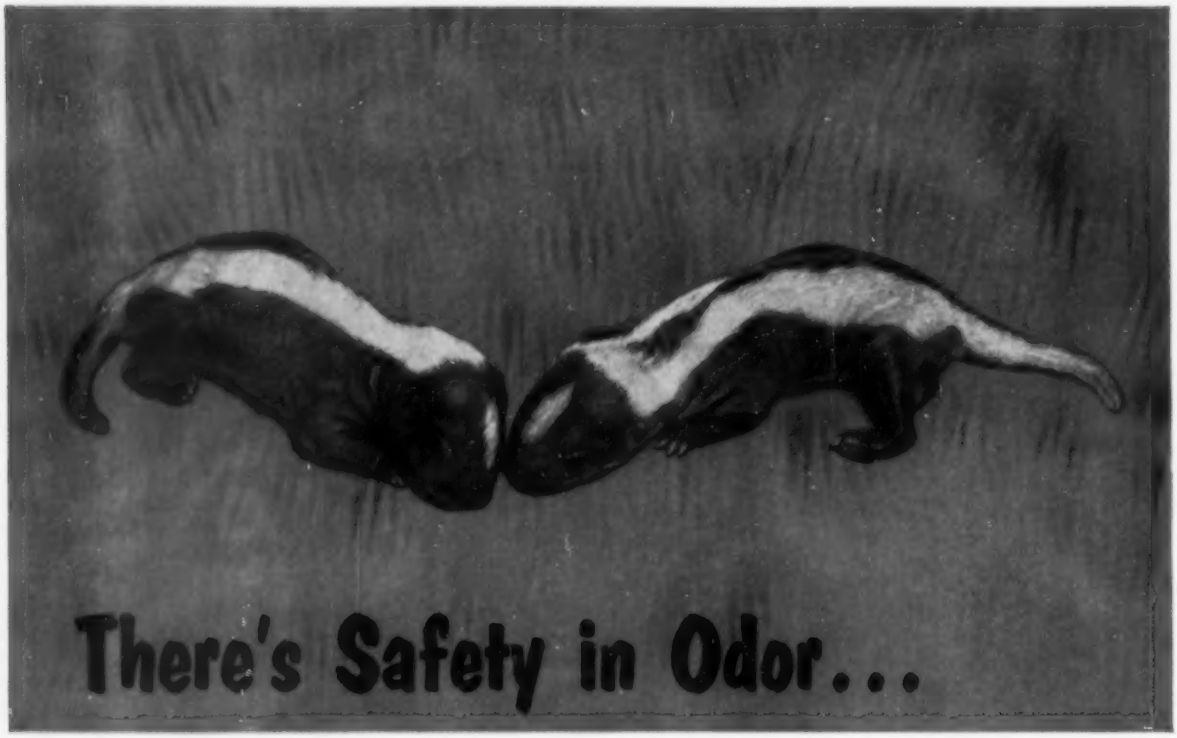
Meanwhile, Canadian government leaders, who seem to be almost constantly in hot water for following too closely the lead of this country, are reportedly running into stubborn opposition to their proposals to increase Canadian depletion allowances to equal the rates now in effect in the U. S. as a means of attracting capital for oil and gas development.

Opponents of higher depletion in Canada, already steaming over allegedly high amounts of American control of Canadian resources, comment caustically that the only capital to be attracted by increases in depletion would be Yankee dollars.

While politics are claiming most eyes, the staid and steady Federal Power Commission plods along on two of the most complicated cases to come before that body in some time.

This month, FPC was scheduled

Continued on page 122



if it ACTS when you need it!

Trouble is, with the one-day-old skunks shown here, their protective odor can't be used effectively for several weeks. It's different with natural gas pipe lines. They just can't wait! An unmistakable, far-reaching odor must be ready for action instantly to warn of leaks and escaping gas.

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SPOTLEAK® 1009

with a can't-be-overlooked, penetrating "aroma" that offers pipeline companies and natural gas distributors these superior advantages over other odorants:

- 80% minimum tertiary butyl mercaptan in every drop of Spotleak 1009.
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THE ROCKWELL

GAS REPORT

DEVOTED TO THE INTERESTS OF THE GAS INDUSTRY

VOL. 1 OCTOBER 1956 NO. 2

To Our Friends in the American Gas Association

L. A. Dixon, Jr., Vice President, Meter and Valve Division (center) says, "We consider it our obligation to keep the development of our products and the improvement of our services ahead of the day to day needs of the gas utilities." P. C. Kreuch, Vice President, Rockwell Manufacturing Company (right) and G. T. Bowman, Assistant Vice President, concur.

We've Worked and Grown Together ....and we're mighty proud to serve a great industry!

Rockwell people have always been closely identified with the A.G.A. They have given freely of their time and efforts to a great many gas industry activities. That is as it should be. For the gas business has been good to us. We have watched it grow and prosper. And with the expansion of the industry we, too, have grown.

Along the way, we at Rockwell have made many contributions to gas through the development of new and better products. These efforts were sparked and encouraged by a cooperative group of gas operating men. To them our thanks. And to all in the A.G.A. we pledge our continued support and close cooperation. Rockwell Manufacturing Company, Pittsburgh 8, Pa.

ROCKWELL Meters and Regulators

ROCKWELL-Nordstrom Valves

Introducing the

INCOMING AGA PRESIDENT

Clare H. Zachry

Clare H. Zachry, president of Southern Union Gas Co., Dallas, Tex.—first vice-president of the American Gas Association for the last 12 months—has been nominated to be president, and will take over the duties of that office immediately after the annual convention at Atlantic City, Oct. 8-10.

Born in Pittsburg, Texas, in 1895, Mr. Zachry has spent his entire business life in that area. He is married and has three daughters, and is a trustee of Baylor University.

Mr. Zachry has been president of Southern Union since January, 1945. He joined the company in June, 1933, coming from the firm of L. E. Cahill and Co., certified public accountants, Tulsa, Okla.

During the years 1933-45, Mr. Zachry rose successively to the positions of secretary-treasurer, vice-president-treasurer, executive vice-president and of the president.

He has always been active in gas industry groups and associations. He is a past president of the Southern Gas Association and was vice-chairman of the Promotion, Advertising and Research (PAR) Committee of A.G.A. He is also a director of the Independent Natural Gas Association.

When Mr. Zachry became president of Southern Union in 1945, the company served some 60,000 customers in 29 cities and communities in Texas and New Mexico. Today, the total number of customers is 250,000 in 62 towns in Texas, New Mexico, Colorado and Arizona.

Julius Klein

Julius Klein Elected President of GAMMA for '56-'57

Julius Klein, president of the Gas Appliance Manufacturers Association for the 1956-57 term, "grew up in the gas range industry." President of the Caloric Appliance Corp., Topton, Pa., he is the fifth son of Samuel Klein who founded the company in 1890. Caloric has manufactured gas appliances since 1930, the year the name was registered.

Born in Philadelphia in 1900, Julius Klein attended the University of Pennsylvania, was married in 1923, has a daughter and two sons. Both boys are active in the company.

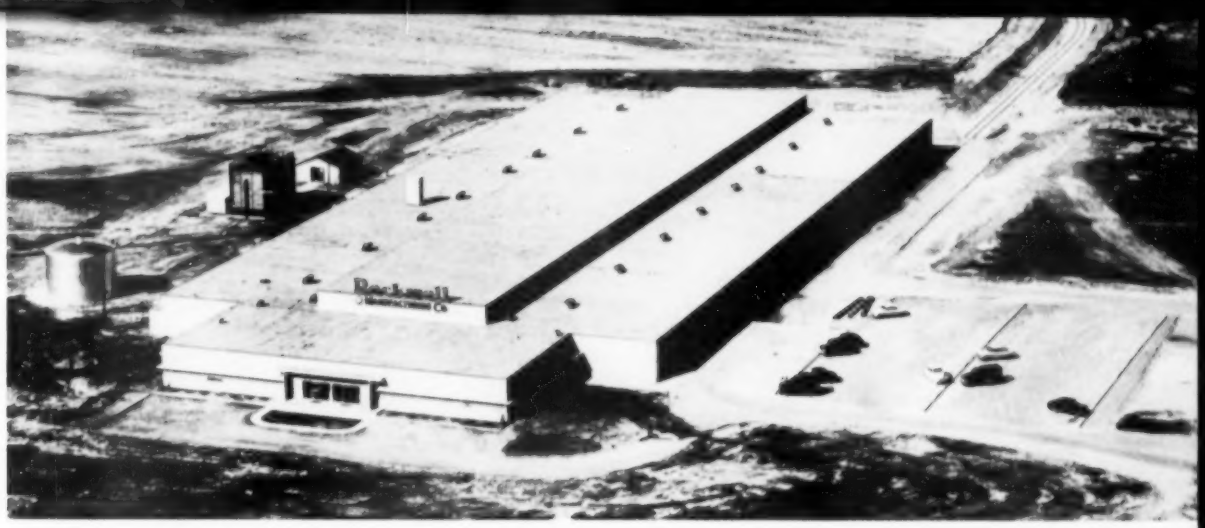
Starting in the sales department, Julius Klein became successively sales manager, vice-president and president, being elected to the latter office in 1950. He is noted for his salesmanship and has guided the company in developing many of its unique and successful merchandising policies and methods.

Julius Klein has always been a strong spokesman in promoting the competitive position of gas as a fuel for cooking and other purposes. He has been a frequent and forceful speaker before many groups in the city gas industry, the LP-gas field, and appliance merchandising circles.

He has served on many committees in the Gas Appliance Manufacturers Association, on its Board of Directors, and was elected president at the annual meeting last April, to take office this month.

Mr. Klein has also been active in the American Gas Association and the National LP-Gas Council since its inception. He is presently on the Advisory Committee of the Council.

GAS REPORT



View of 126,000 sq. ft. Rockwell plant at Sulphur Springs, Texas, completely air-conditioned by gas.

Rockwell's Texas Plant

GAS AIR-CONDITIONED!

By P. E. W. Goodwin, Jr., Plant Manager

Completed and opened for production in 1954, the Rockwell plant at Sulphur Springs, Texas is one of the most modern in the South and Southwest. It was established to better serve the users of valves, meters and other Rockwell products in this important area.

While erected primarily as a manufacturing center for Rockwell-Nordstrom valves, the spacious building also serves as a warehouse depot and service center for all Rockwell equipment furnished to Southwest industries such as natural gas, petroleum, chemical and petro-chemical.

The plant features a 116,000 sq. ft. factory area of windowless construction with glazed tile walls to facilitate cleanliness. It is completely air conditioned. Another feature of this plant is that more than 300 Rockwell-Nordstrom valves are utilized in plant services.

Gas air-conditioned

Of particular interest to the gas industry is the use of natural gas-fired boilers to provide steam for a 450 ton air-conditioning system. There are two 130 h.p. boilers which provide the energy to drive a turbine. The turbine, in turn, drives a centrifugal compressor which cools water for the daily requirement of refrigeration. Circulating pumps carry this coolant to ceiling suspended blower units throughout the plant. The temperature of the cooling water is held at approximately 45 degrees. Freon is used as the refrigerant. Natural gas is supplied by the Lone Star Gas Company.

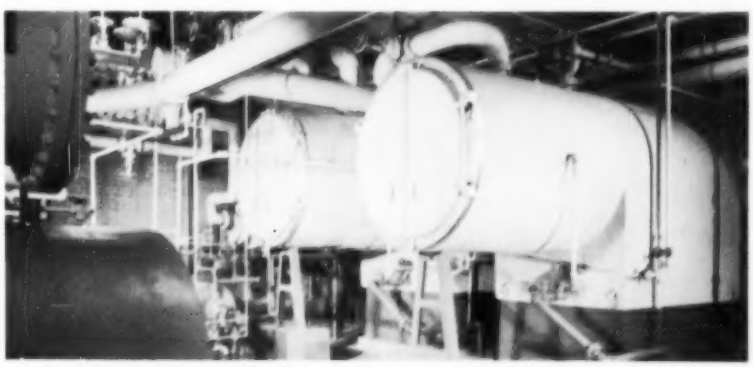
The system is a combination one for both cooling and heating. In cold weather, hot water is circulated through the air distributing units.

Plant temperature is maintained at 76 degrees, automatically controlled to within a range of two degrees, plus or minus. Relative humidity is maintained at 50 per cent. Year round temperature and humidity control enable plant supervisors to maintain rigid quality control and assure a high degree of product uniformity. The efficiency of plant employees is increased since they always work within the comfort zone.

The demonstrated success and economy of the air-conditioning system at Sulphur Springs has resulted in the adoption of similar gas air-conditioning programs for recent Rockwell plant additions at Tupelo, Mississippi; Russellville, Kentucky; Kearney, Nebraska; Porterville, California; Dubois, Pennsylvania; and Knox, Indiana.

The Author

P.E.W. Goodwin, Jr. was named manager of the Rockwell plant in Sulphur Springs, Texas when it first opened. Prior to that he served as purchasing agent and manager of parts manufacture for the company's Oakland, Calif. properties. He is a World War I veteran and before joining Rockwell in 1944 was employed for 20 years in the management of purchasing and stores for the Fruit Growers Express Company.



Boiler room in Rockwell's Sulphur Springs plant where natural gas powers the 450 ton air-conditioning system.

IS TEMPERATURE COMPENSATION FEASIBLE IN DOMESTIC METERS?

By Howard J. Evans
Manager, Central Gas Products Engineering Department
Rockwell Manufacturing Company

During the past few years more and more thought has been given to the effects of temperature on gas meters. With the increased cost of reading meters many utilities are considering moving the meter from the basement to an outside location. This program has been given further impetus by the greater use of natural gas in the East and by the construction of houses without basements, plus the definite trend towards the use of hard case meters which can stand the extra abuse received outdoors.

While outside metering has been practiced for many years, it has been done largely in areas where the degree days were relatively low.

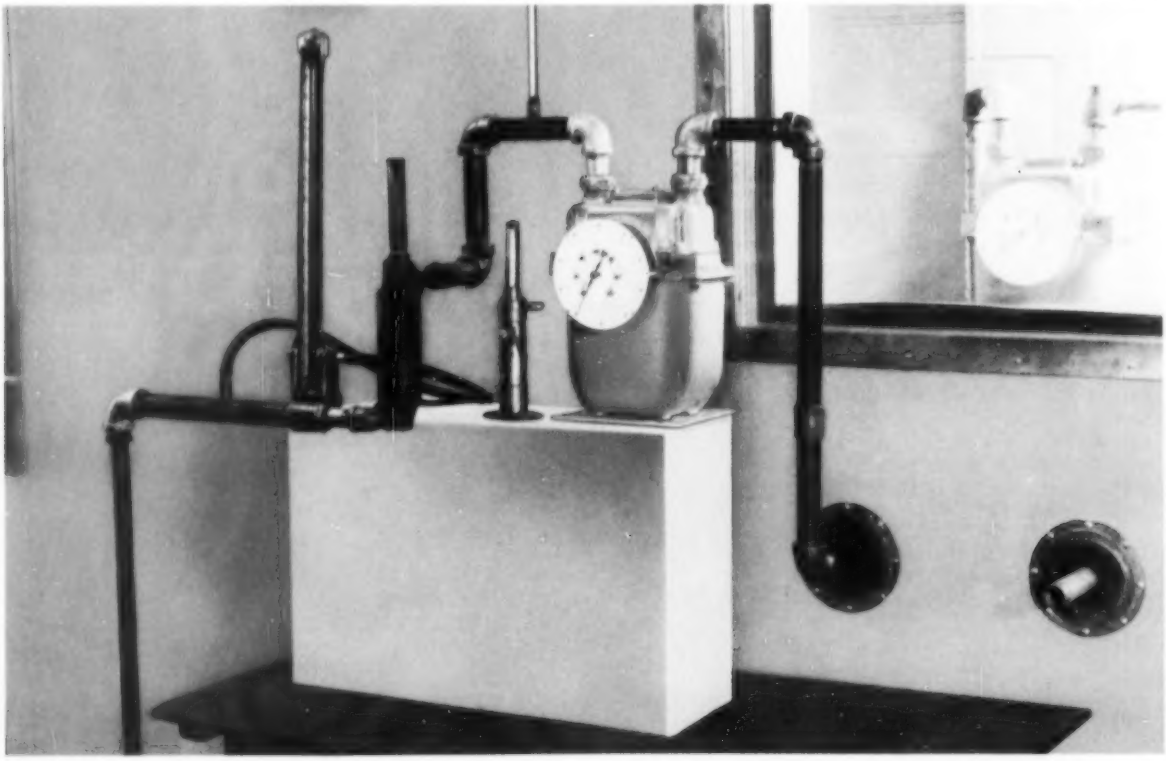
The gas rates established by the various companies must be based not only on the cost of gas and its distribution but also on the loss of unaccounted-for gas. There is no doubt that part of the "unaccounted-for" is due to an error in metering at different temperatures since gas volume will vary about 1% for every 5% change in temperature. This has been verified by many companies who have noted that the amount of unaccounted-for gas will vary from month to month with the temperature

Effects of temperature

Over a period of years we have conducted a number of tests at the laboratory level to determine the effects of temperature on metering. In one of our first tests we moved a prover into a walk-in type refrigerator, then tested 36 Rockwell meters (9 each of the 4 domestic sizes) for accuracy and capacity at temperatures ranging from 76° F to —3° F. The results of this test were conclusive only to the extent that all meters speeded up as the temperature was lowered and that all showed a drop in capacity depending on the type of diaphragm used. In general the greatest variance in proof between 76° F and —3° for any tested meter (average of open flow and check flow) was from —1.0 to +3.2.

In a more recent ambient temperature test, two identically calibrated Rockwell 175 meters were connected in series. One meter considered as the test meter was placed in the cold room

Ambient temperature tests conducted in walk-in type cold room. Readings of base meter outside were compared with those of test meter inside when subjected to lowered temperatures.



and the other, the base meter, outside. The amount of piping used in the cold room was equivalent to the exposed piping in an outdoor setting. Tests were run at flow rates of 20, 50, 100 and 175 cfh. The temperature in the cold room was lowered successively from 75° F to 58° F to 29° F to 0° F and finally to —20° F. At each flow rate and at each temperature drop two, five, and ten cubic feet were passed through the base meter and the registration of the test meter recorded. After each individual flow, a delay of five minutes was given to permit the meters to return to ambient temperatures.

From these test results a correction factor was evolved based on the percentage of volume recorded by the test meter as compared to the base meter. Each flow rate was then plotted as a separate curve sheet to show the changes caused by lowered temperature. The results were further analyzed by developing theoretical curves, based on Charles Law and plotting a correction factor for change in meter proof, using 75° F as the base and any change thereof as an increase in the speed of the meter.

Space does not permit depicting all these curves. Prints can be obtained by writing the author. A plot of an average of all these tests is shown which gives the corrected volume for any ambient temperature irrespective of the flow rate.

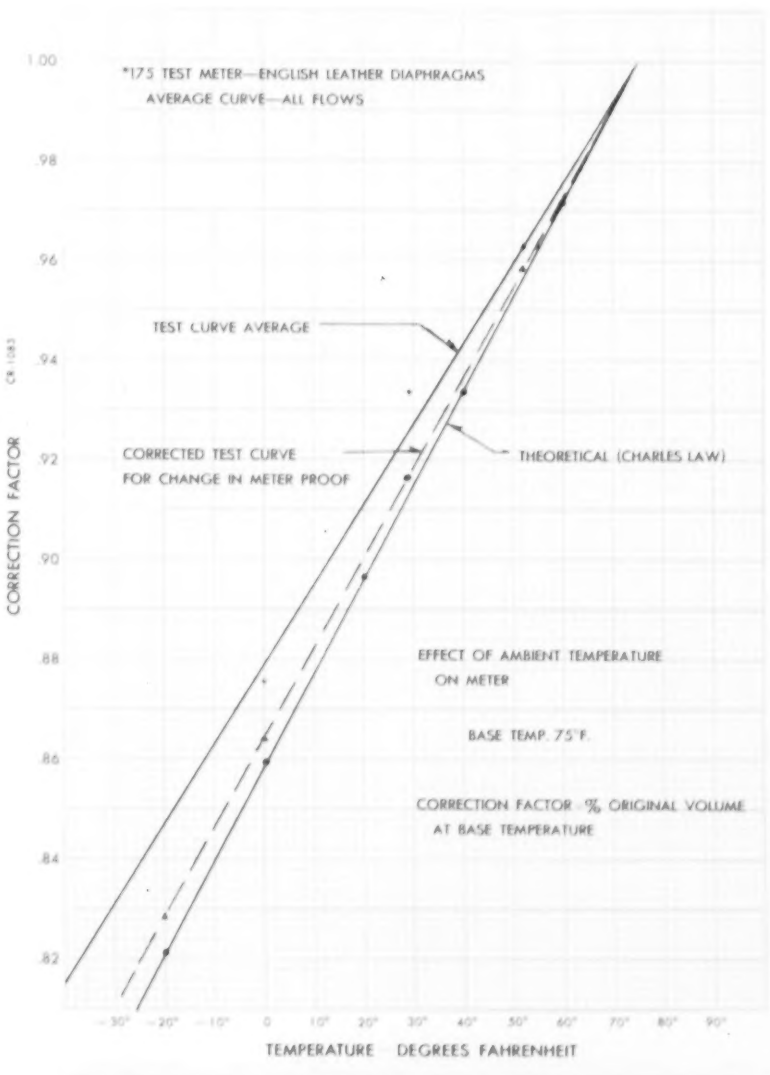
Revenue Gains

Of interest is a practical application of revenue gains that may be realized by temperature compensation. With the cooperation of a large gas company and the Weather Bureau we developed a table of tariff calculations based on an average load for residential space heating and for cooking and water heating. By applying a degree day deficiency factor and extending the previously developed figures to a temperature corrected metered base, we showed that the average revenue increase per service on this company's lines could amount to $4.00 per year. This would amount to a 3.5% decrease in metered gas volume due to an outside meter setting.

In general it would appear that temperature compensation in domestic metering is highly desirable. There is the problem of manufacturing a correcting device which can be produced at a sufficiently low price. Basically, such a compensator should be positively driven, easily checked for accuracy, and rugged enough to stand years of operation under adverse conditions. These qualities will be required before it would be acceptable to the gas industry.

The Author

Howard J. Evans, a native of San Diego, Calif., and a mechanical engineering graduate of the University of Oklahoma in 1933 (master's degree 1934) joined the Rockwell engineering staff in 1935. He successively was promoted to chief engineer, Dubois Division, chief engineer, Pittsburgh Division and to his present position in 1954. Mr. Evans has served on the A.G.A. Sub-Committee for Listing Requirements for Appliance Regulators and as a member of the Fluid Meters Research Committee of the A.S.M.E.



Curve showing effects of ambient temperature on meter during comparative tests.

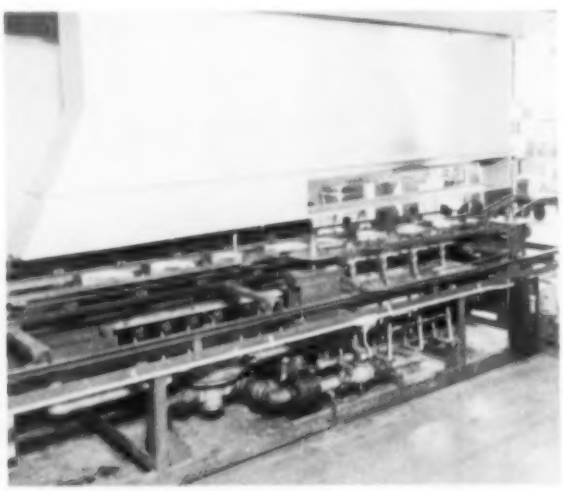
GAS
REPORT

GAS GOES TO WORK
IN MODERN REPAIR FACILITIES

For Public Service Electric & Gas Company of New Jersey

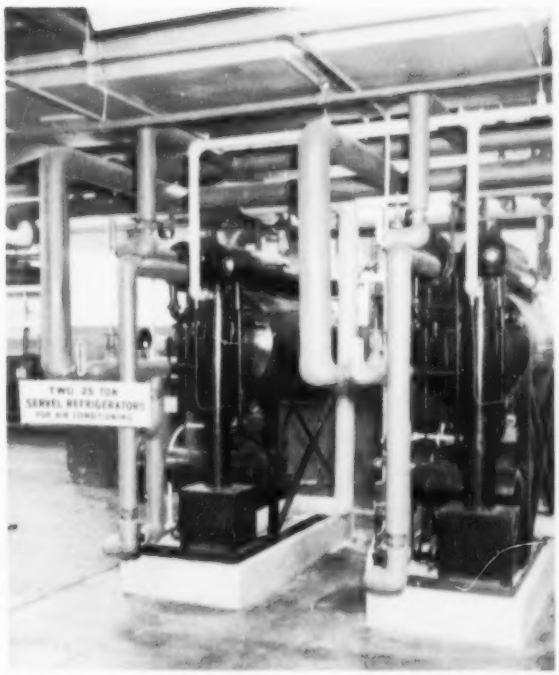
Gas-fired opening machines remove parts from meters without distorting them. Rockwell products control air and gas supply to the six machines.

Meters running constantly at rated capacity on this performance test rack enable Public Service to evaluate new meter designs under local gas conditions. Gas supply to this rack is controlled by two 3-in. Rockwell regulators, maintaining ½ in. pressure differential across inlet and outlet manifold.



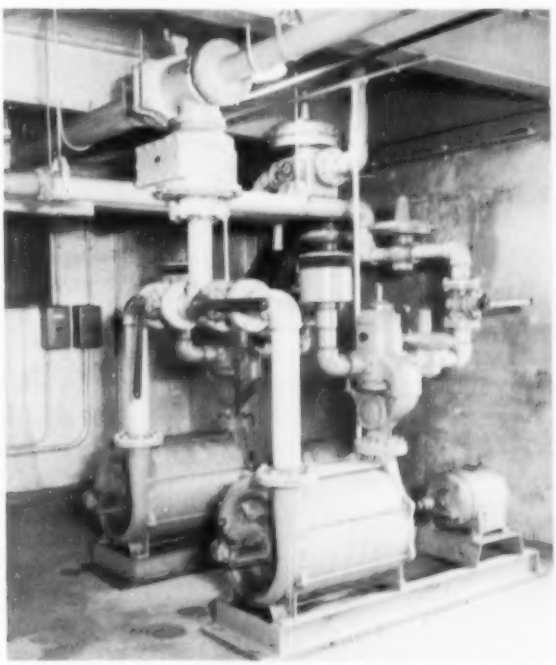
Unique automatic machine desolders and tins diaphragm discs removed from completely overhauled meters in fraction of time required by hand operation. Gas pressure to critical burners controlled by Rockwell regulator.

Two 200 horsepower gas-fired boilers produce steam for heating, cooling, and processing purposes. Rockwell regulators control gas pressure to these boilers.



Artesian well water lines controlled by twelve Nordstrom lubricated plug valves supply cooling water to refrigerating units. The entire shop and office areas are summer air conditioned.

A 100 cubic foot capacity meter prover tests large commercial and industrial gas meters for accuracy. A 6-in. Nordstrom plug valve controls this prover.



Rockwell regulators and lubricated plug valves control gas pressure to air-gas combustion controllers supplying gas to repairmen's bench furnaces and other shop equipment.

ROCKWELL

Personalities

IN THE NEWS

W. R. McLaughlin

The Southern Gas Association recently honored Bill McLaughlin by electing him to its Board of Directors. An acknowledged authority on gas measurement and control, he has served tirelessly on many committees of the A.G.A., A.P.I. and N.G.A.A. In 1955 he was presented with a scroll in recognition for 32 years of consecutive service to the Southwestern Gas Measurement Short Course at the University of Oklahoma.

He joined Rockwell in 1934 as a sales engineer in Dallas after 15 years with Arkansas Natural Gas Company. Later he served as manager of the gas division in Pittsburgh and as special sales representative in the southwest. He was named to his present position of the Southwestern Regional Manager in 1954. Mr. McLaughlin headquarters in Dallas.

W. M. Connor

Bill Connor has been named Assistant to the Vice President, Manufacturing for six Rockwell plants. In this capacity his duties will include production liaison between Meter and Valve Division national headquarters in Pittsburgh and divisional plants. In 1929, Bill Connor joined Rockwell as a storeroom clerk and in 1936 he became assembly superintendent for the Dubois plant. Fourteen years later he was named Works Manager. In 1952 he was promoted to Factory Manager of the Pittsburgh Division and in 1953 he was made General Manager of the Macnick Division in Tulsa. Since 1954 he has been General Manager of the Dubois Division—the largest gas meter manufacturing facilities in the United States.

J. Pommersheim

The recently announced Rockwell Telapilot control for distribution regulators is the brain child of Joe Pommersheim. The new, unique Rockwell Telapilot, in combination with standard telemetering units, permits fully remote pressure control throughout gas distribution systems. Joe now serves as Chief Engineer at the Norwalk, Ohio regulator plant. Prior to that he was a project engineer in the Central Gas Products Research and Development Department.

He joined Rockwell following diverse experience with United Engineering and Foundry Company and Miller Pottery Engineering Company. He is a mechanical engineering graduate of the University of Pittsburgh.

Rockwell Report

by **W. F. ROCKWELL, JR.**
President
Rockwell Manufacturing Company

THE 39TH ANNUAL MEETING this week of the American Gas Association in Atlantic City has focused attention on the tremendous growth of the industry since the gas light days. Millions of people who enjoy daily the comfort and convenience of gas are surprised to learn that what is now the sixth largest industry in the United States was—not too long ago—an unwanted by-product, a nuisance to be disposed of.

Gas has become the fastest growing American industry for three very basic reasons. First, to quote the Gas Equipment Manufacturers Committee, it is "7 ways better for the 7 big household services." Second, it is vital to so many industries. And third, the men who have led the industry have been men of unusual vision and ability—qualities which have also made them leaders as citizens on both the local and national scene.

While this is the fortieth anniversary of our Rockwell-Nordstrom valve—the most widely used valve in the gas industry—our gas meters and regulators were serving the industry many years earlier. In fact, one of the meter companies which formed the nucleus of our organization was producing gas meters as far back as 1883.

We began as producers of basic measuring and control devices for gas. Through research leading to better products and through effort leading to better service we have grown with the industry. We hope to continue to do so.

* * *

We have always done our best to support, in a practical way, the industries we serve. That is why natural gas air conditioning was built into the four newest Rockwell plants, and has been specified for two others soon to be built.

* * *

Concurrently with the considerable expansion of our field sales force, we have also expanded and completely revamped our sales training program for both new men and veterans. The most recent class to be graduated from the intensive three-month course was trained especially for service to the gas industry.

* * *

The wide variety of industrial gas applications in use today, and the growing need for in-plant metering, often raise the question of what type of meter to use for a specific application. To help plant engineers and operating people with this problem, our Industrial Meter Division has compiled an easy to follow meter check list broken down by types of applications, including those requiring special meter construction.

* * *

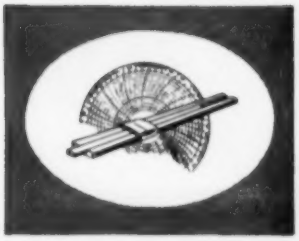
For obvious reasons, the first person singular has never been used in these reports. This paragraph is a necessary exception simply because I don't know how to avoid it in saying how much I appreciate the encouragement and practical help given me by gas industry men during my term, now ending, as president of the Gas Appliance Manufacturers Association. It has been a good year for me and, I hope, a reasonably constructive one for the Association.

One of a series of informal reports on the operations and growth of the

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

for its customers, suppliers, employees, stockholders and other friends

technical trends



By GUY CORFIELD

Public vs private power development

The current argument on whether the government, or private industry, should take the lead in construction and development of peacetime nuclear power plants is reminiscent of the post-war controversy over the fate of the wartime synthetic rubber plants and, to a lesser degree, paralleled by the perennial argument over government vs. private industry production of synthetic liquid fuel from coal and oil shale.

The Gore bill recently introduced by Sen. Albert Gore (D-Tenn.) has stirred considerable debate. The senator contends that we are losing the atomic power race with Russia and Britain because of the slowness with which private industry is moving; that we need reactors in operation for kilowatt capacity; that six reactors of different types should be built in varied locations; and that the government should build them.

The Atomic Energy Commission is completely opposed to the Gore bill. Its position is that "the goal of the U. S. policy should be the eventual development of economic nuclear electric power and not an immediate "kilowatt race" with other nations; that private industry is responding well considering that it is less than two years since it was invited to participate; and that private industry is in the best position to decide which types of reactors are most promising and economic, take the financial responsibility and sustain the losses or reap the benefits that may accrue.

Industry objections to the Gore proposal emphasize that government operations would involve a serious drain on technical manpower which is already inadequate (presumably feeling that if industry handles the nuclear developments it can retain its manpower at least on a part-time basis).

Two factions appear to be developing, one proclaiming the need for more kilowatts and immediate and assured international supremacy, and the other advocating more broad and general and perhaps more orderly and economic technological progress. The situation would seem to require rather immediate decision, possibly the most difficult and important that has ever confronted our nation.

AGA approval requirements

The gas industry is, of course, well aware of the Appliance Approval Requirements program administered through and by the American Gas Association Laboratories at Cleveland and Los Angeles; and that under this program domestic and some commercial appliances are tested and approved for safe operation, substantial and durable construction, and acceptable performance.

The scope of this program, however, and the time and effort expended on it not only by the laboratories, but also by gas utility and gas appliance and accessory manufacturer personnel, may not be generally realized, and some overall statistics and estimates may be of interest.

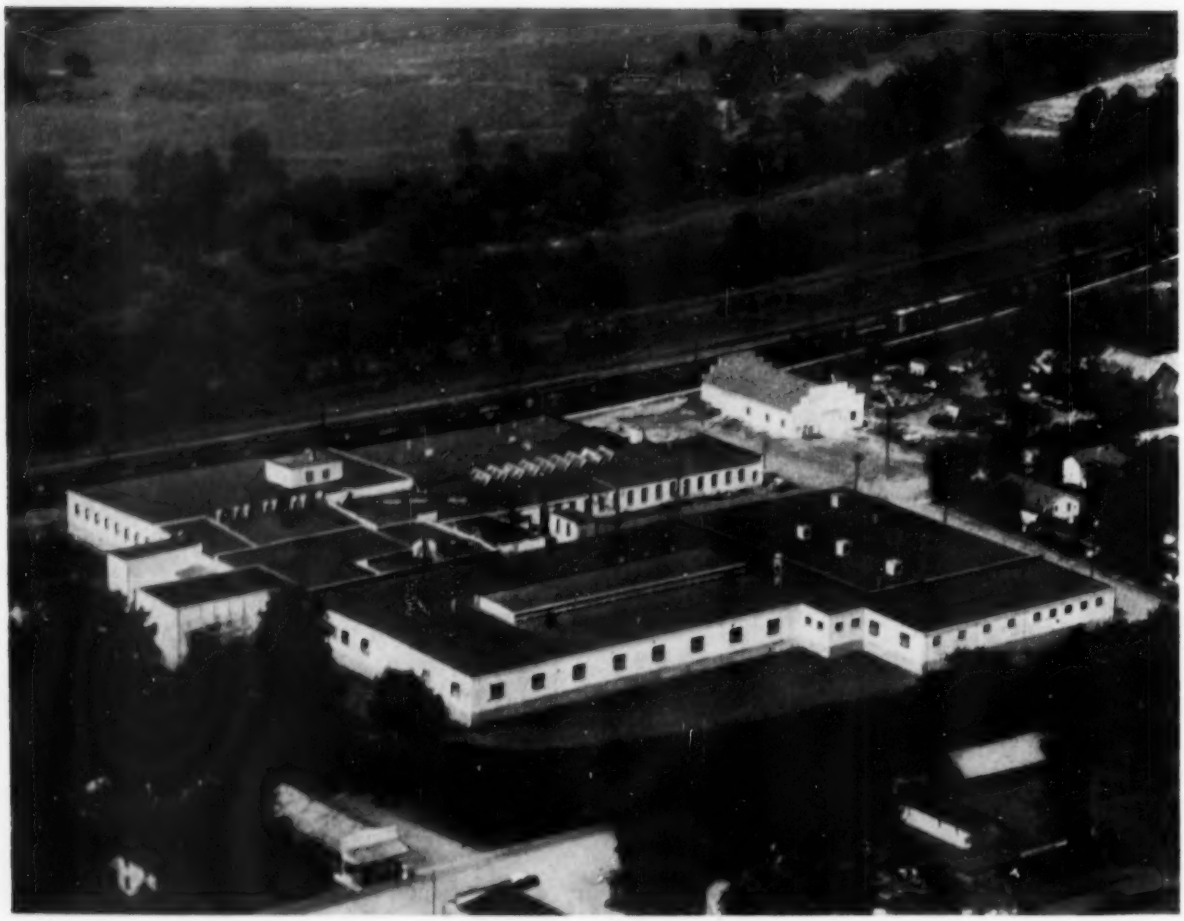
According to the AGA annual report for 1955, the laboratories received $1,249,852 in testing and examination fees from appliance manufacturers, and spent $100,854 on approval requirements research.

From the industry personnel standpoint, and in addition to the approval requirements committee which exercises general supervision, there are currently approximately 25 subcommittees, with a total membership of approximately 400. This committee and subcommittee group, about half from utilities and half from GAMA, is selected on a country-wide basis. They are responsible for the development and interpretation of all the Approval and Listing Requirements for appliances and accessories. Some subcommittees meet rather infrequently but others assemble several times a year. Meetings are usually held in Cleveland, Ohio or some other central point.

If these 400 members attend two meetings per year, and spend three days at each meeting (including travel time), plus three days of their or other personnel's time in preparation, it can be calculated that their time is costing $180,000 per year; added to this is travel expense which, if assumed to be $150 per trip, will amount to $120,000 annually. The total comes to $300,000.

It is doubtful if anyone will argue that this is an uneconomic or unjustified effort or expense. Actually it seems amazing that such an elaborate and comprehensive national program can be conducted at a cost of only a little over $1.5 million per year.

LONG LIFE



The home of Vulcan Diaphragms

This new modern plant in Buena Vista, Virginia, houses the people and the most advanced equi| ment for the completely integrated production of Vulcan Diaphragms. Over 100,000 square feet of space is devoted to turning raw materials into coated fabrics and finished diaphragms.

With the ultimate in laboratory facilities the quality control of each Vulcan Diaphragm is carefully governed from start to finish. Facilities for continuous research and development provide assurance that Vulcan will maintain its position as the leader in the field of synthetic diaphragms for meters, regulators and controls.

REEVES BROTHERS, INC. · *VULCAN RUBBER PRODUCTS DIVISION*
54 Worth Street · New York 13, N. Y.

means LIFE LONG

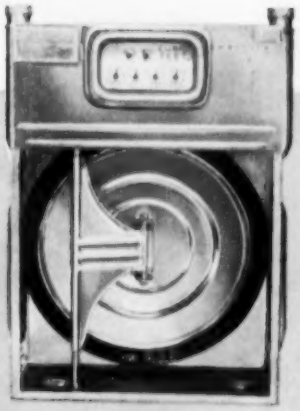
Accelerated life tests are proving that Vulcan Diaphragms last the life of the meter—while maintaining high accuracy and showing no evidence of speed-up.

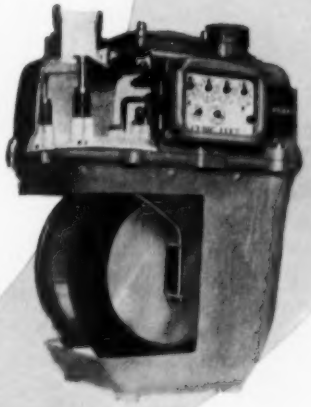
In actual field operation Vulcan Diaphragms have been in use in all climates, indoors and outdoors for over 20 years.

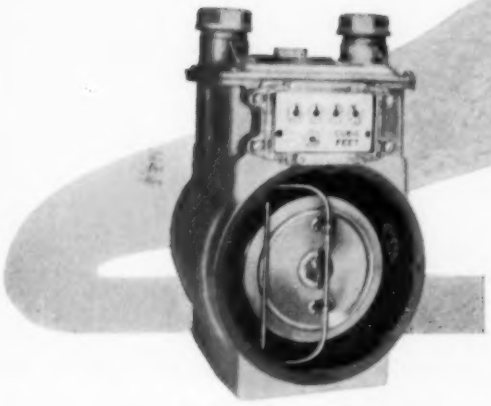
This long life and absolute accuracy are achieved without periodic attention—when you use Vulcan Diaphragms—available at no extra cost to you.

No matter what type of gas your meters must handle—natural, L.P., manufactured or combinations, Vulcan Diaphragms provide long life and utmost accuracy.

When you order—*specify* Vulcan Diaphragms for your meters, regulators and controls.







Another REEVES VULCAN RUBBER PRODUCT

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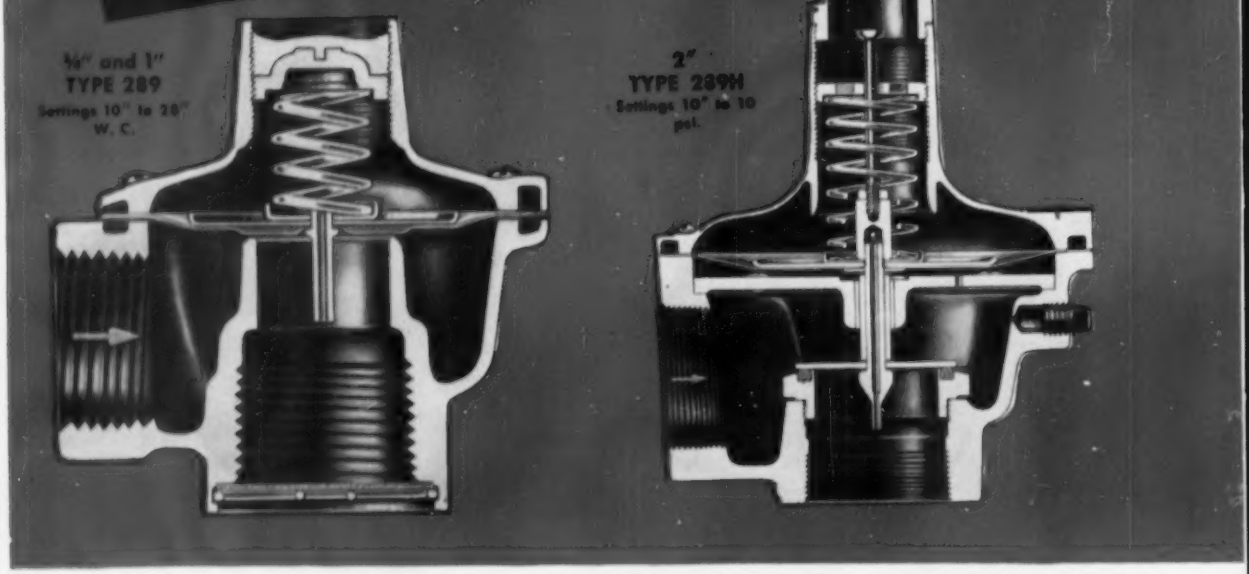
FOR GENUINE RELIEF FROM OVER PRESSURE WORRIES

HIGH CAPACITY with SMOOTH PRECISE ACTION



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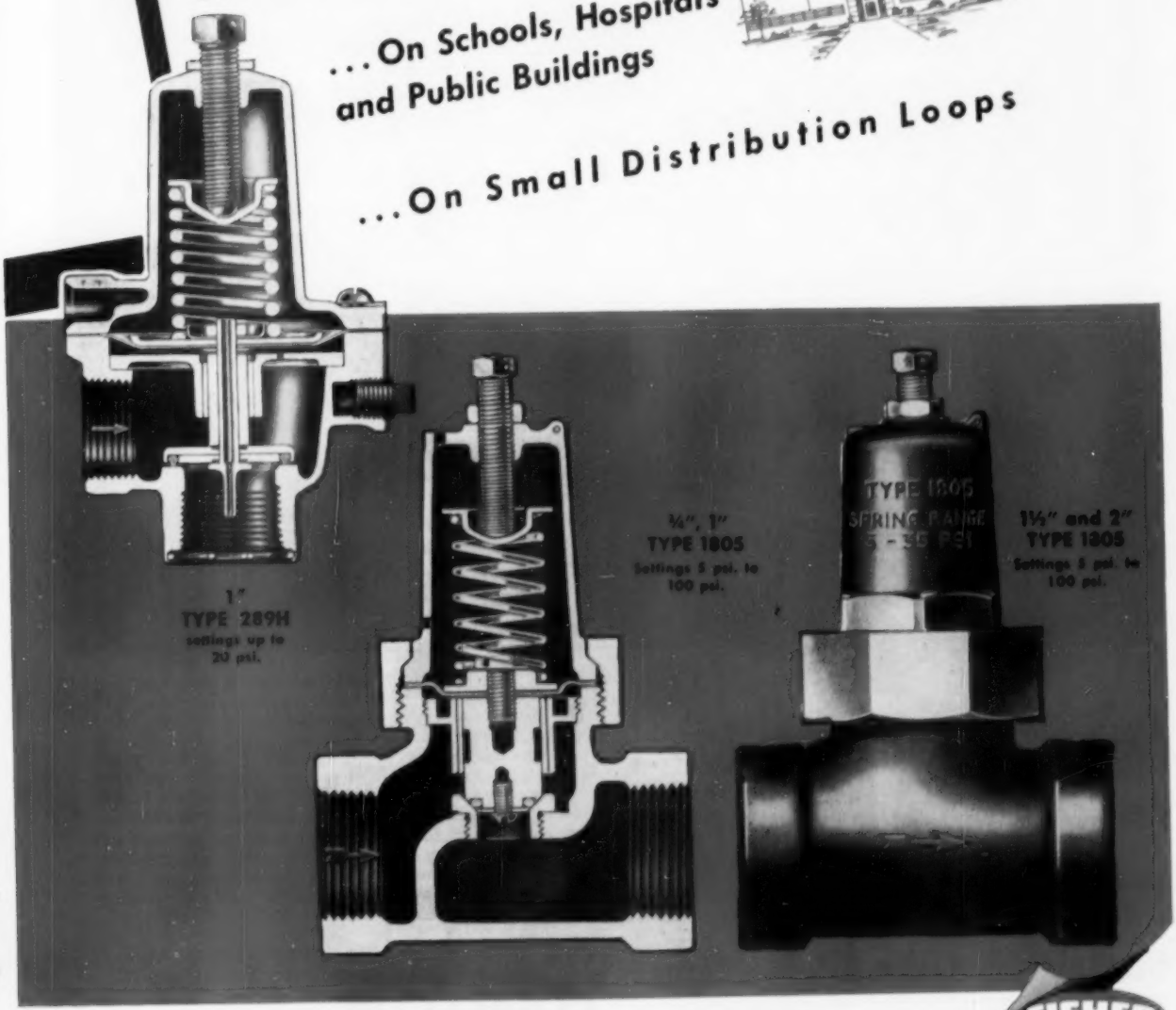

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FISHER

BETTER GAS PRESSURE CONTROL

Since 1880

COMPLETELY

MECHANICAL–

FULLY RELIABLE

Barton Model 236 Flow Meter
Combines Barton Model 199 rupture-proof bellows unit with Librascope Flow Computer. No cams, intermittent devices with built-in switch for remote reading.

Librascope's pressure-compensated, totalizing flow computer

HIGH ACCURACY

MADE POSSIBLE

THROUGH

CONTINUOUS

INTEGRATION

DEVELOPED AND PRODUCED BY
LIBRASCOPE, INC.
GLENDALE 1, CALIFORNIA

A SUBSIDIARY OF GPE

The Barton Instrument Corporation now distributes Librascope's new flow computer, a unique design that solves many problems associated with flow computation. In addition to the high degree of *reliability* inherent in mechanical, non-electrical devices, and *accuracy* made possible by continuous integration of static and differential pressures—this unit provides considerable cost *savings* by eliminating the time consuming and often inaccurate function of hand integration. Revolutionary in design, the computer fits new or old meter cases, and existing air transmission systems. It may be ordered with electrical or hand-wound drives. Write Barton for further details.

Distributed throughout the Western Hemisphere by

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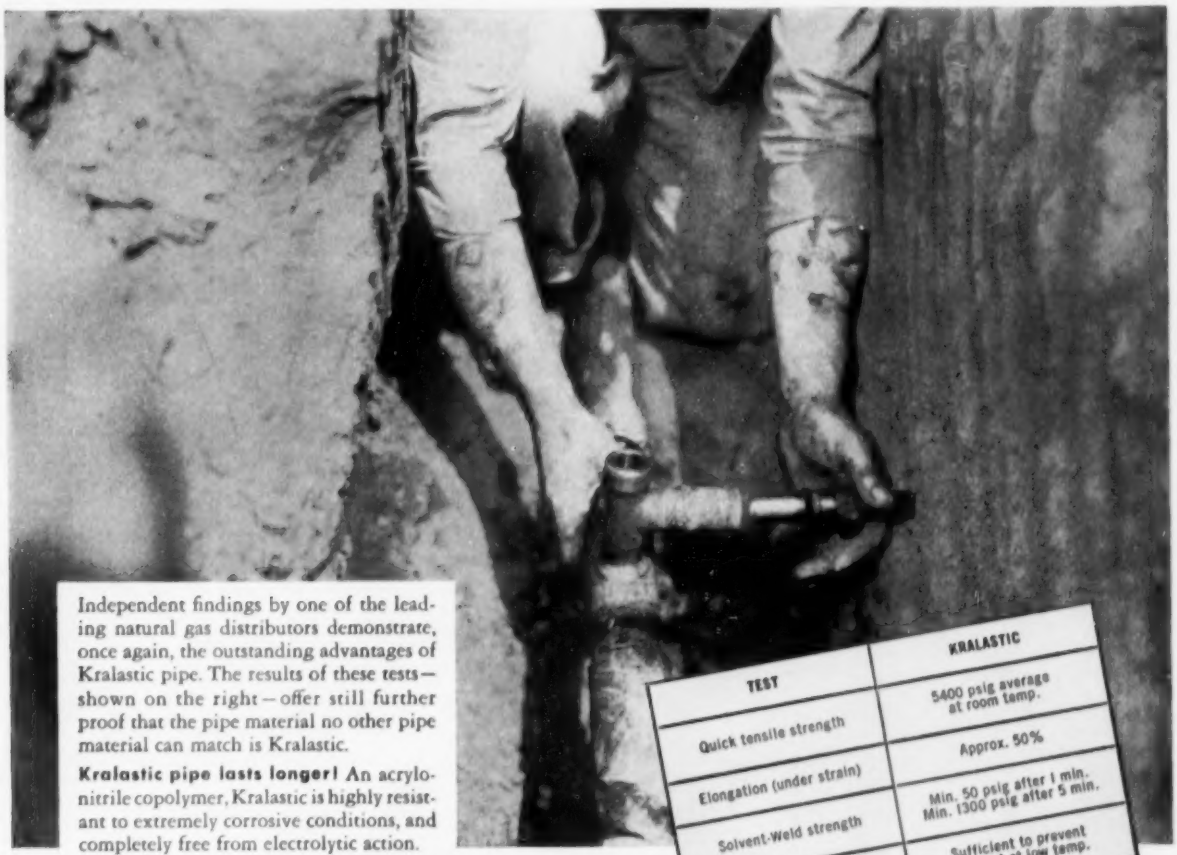
Gas Company's tests prove

Superiority *of* Kralastic *pipe!*



Independent findings by one of the leading natural gas distributors demonstrate, once again, the outstanding advantages of Kralastic pipe. The results of these tests—shown on the right—offer still further proof that the pipe material no other pipe material can match is Kralastic.

Kralastic pipe lasts longer! An acrylonitrile copolymer, Kralastic is highly resistant to extremely corrosive conditions, and completely free from electrolytic action.

Kralastic pipe is easy to handle—easy to install! Kralastic pipe lends itself to snaking through existing lines, eliminating costly, time-consuming labor. Solvent welds can be made and tested in minutes, and because Kralastic is lightweight, one man can carry all that's necessary for the average home service.

Kralastic pipe is easy to maintain—exhibits no scale or interior build-up—is unharmed by alcohol or methanol frequently used to clear freeze-ups.

The first rubber-resin to produce successful plastic pipe, Kralastic has proved its unmatched advantages for carrying natural gas, brine, oil, water, and for many other applications. For additional information on how Kralastic® pipe can economically serve *you*, and for your copy of the test report, write to us, today.

TEST	KRALASTIC
Quick tensile strength	5400 psig average at room temp.
Elongation (under strain)	Approx. 50%
Solvent-Weld strength	Min. 50 psig after 1 min. Min. 1300 psig after 5 min.
Elasticity	Sufficient to prevent pull-out at low temp.
Effect of alcohols and methanol	Very slight
Accelerated corrosion (buried in moist spent oxide)	No trace
Exposure to weather (after approx. one year)	Tensile = 20% above new Elongation = 20% below new

United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Gastonia, N. C. • Chicago • Los Angeles • Memphis • New York • Phila.
IN CANADA: Naugatuck Chemicals, Elmira, Ontario • Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N.Y.

CUSTOMERS WHO BUY FOR

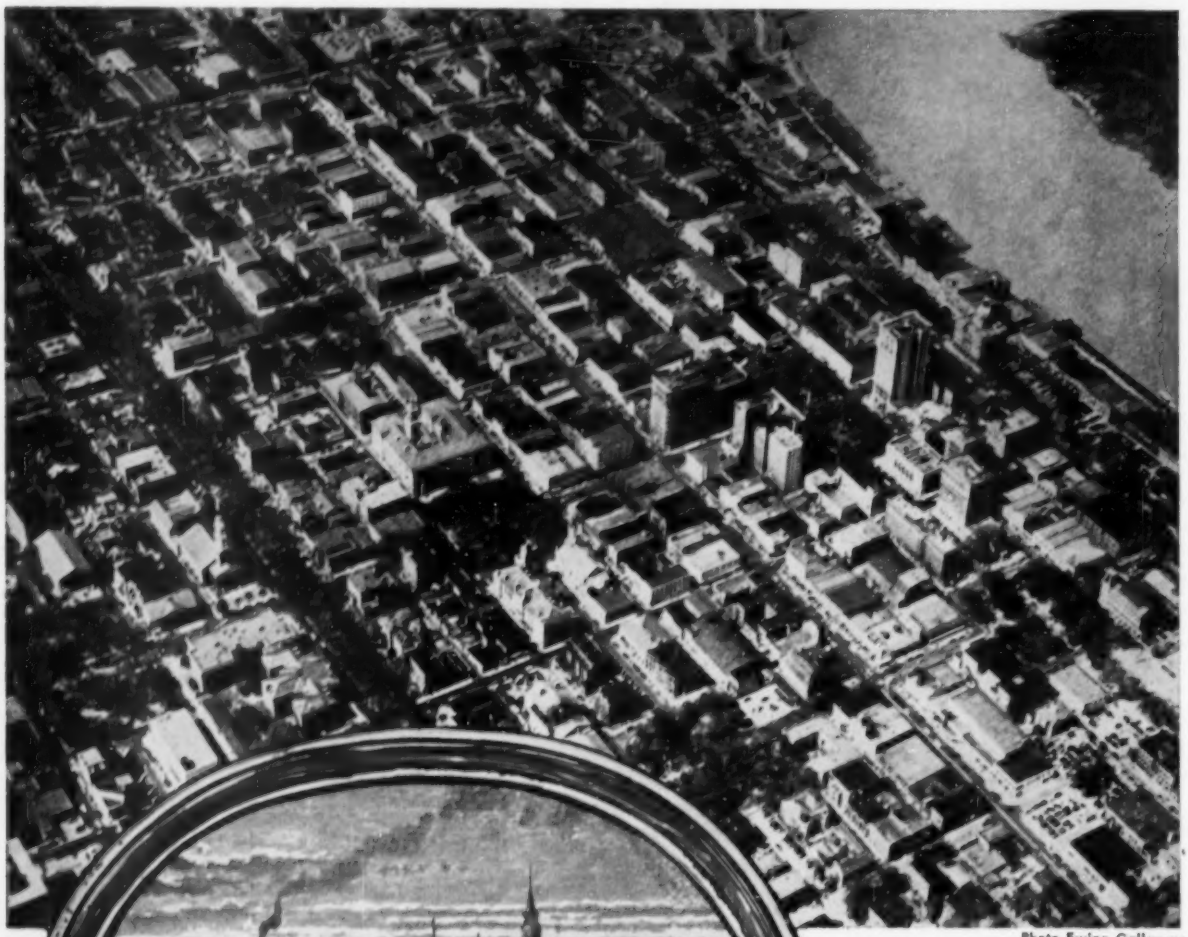


Photo Ewing Galloway

This is the gracious, thriving seaport city of Savannah, Georgia, as it looks today.

Bettmann Archive

This is Savannah as the city looked about 100 years ago.

MECHANICAL JOINT cast iron

A CENTURY ARE CUSTOMERS WHO KNOW FOR SURE!

SAVANNAH GAS CO. installed cast iron gas mains 100 years ago . . . and still installs them.

Savannah Gas Company was organized in 1848. Population of Savannah was then 13,573, made up of 7,250 whites, 637 free negroes and 5,686 slaves. Today this company is serving 23,762 customers with natural gas. The distribution system contains approximately 179 miles of mains of which about 73% are cast iron.

The Savannah Gas Company has been buying cast iron pipe for more than a century. So have public utilities in more than 60 cities in the United States and Canada. Such customers, in any industry, are rare indeed. They must have a compelling reason. They do. They have proof—*sure* knowledge—of the long life, reliability and economy of cast iron pipe.

Cast iron pipe has been a rugged, long-lived product from the earliest days of the gas industry. Today's *modernized* cast iron pipe, centrifugally cast and quality controlled, is even stronger, tougher, more uniform.

Cast Iron Pipe Research Association,
Thomas F. Wolfe, Managing Director,
122 So. Michigan Ave., Chicago 3, Ill.

CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

This cast iron gas main laid in Savannah in 1848-49 is still functioning after more than a century of service.

pipe FOR MODERN GAS DISTRIBUTION

THE PIEDMONT NATURAL GAS COMPANY'S expansion in and around Greensboro, N.C. requires trench excavation under many different types of digging conditions. This Cleveland 92 "Baby Digger," owned by Bill Gray of Kernersville, N. C., is shown cutting a relatively short and easy run (2,000 feet) for a main extension in a new housing subdivision.

But not all of Piedmont's jobs are as easy as this. Gray gets his share of the tough digging jobs too—wet and sticky soils, rocky ground, narrow rights of way with plenty of obstructions, a wide variety of trench width and depth specifications—yet he digs them all successfully with his dependable Cleveland. Shown at the right is a list of some of the features of the Cleveland 92 "Baby Digger" which Gray considers particularly helpful in trenching work for the gas industry.

FEATURES OF THE "92" HAVE HELPED MAKE CLEVELANDS THE STANDARD TRENCHERS OF THE GAS INDUSTRY FOR OVER 30 YEARS

Compact Design. The "92" is only 4 feet, 6 inches wide, can put a 20-inch wide trench within 17 inches of a parallel fence or wall.

Light Weight. The "92" weighs only 10,000 pounds and its smooth long crawlers make it easy on lawns, sidewalks, etc.

Width Range. The "92" gives you 3 optional digging width ranges, from 10 to 20 inches.

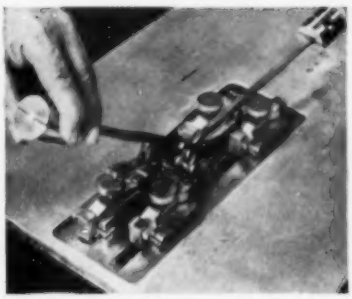
Dependable Production. Quality construction and safe truck-speed portability keep the "Baby Digger" always ready for all your digging. With it you have "trench on tap", permitting the tightest scheduling by you for more production in more places, conserving your labor forces and your equipment dollars.

Good Everywhere

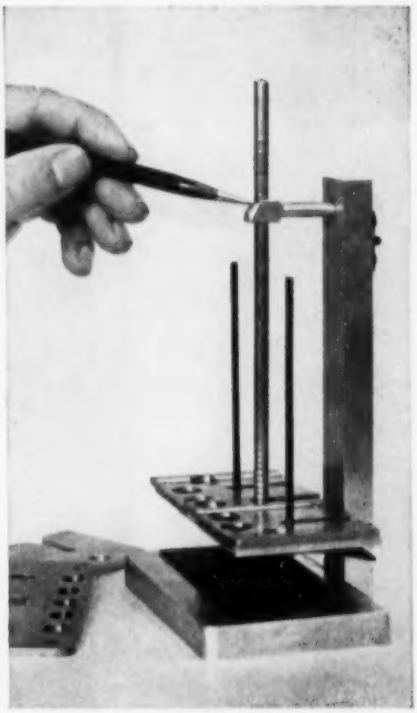
THE CLEVELAND TRENCHER COMPANY

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

UNIFORMITY of weight and thickness of "Fairprene"* diaphragm material is assured by beta ray testing. Thickness of neoprene coatings is constantly controlled to meet the most exacting requirements.

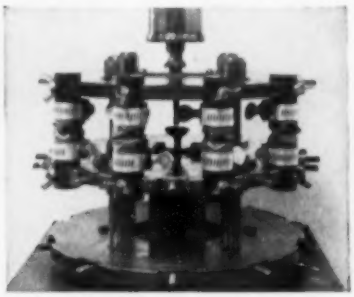


SCRUB RESISTANCE of "Fairprene" diaphragm material is demonstrated by scrub test. Neoprene coating is securely bonded to fabric backing . . . is virtually unaffected by constant flexing and friction.



CONTROLLED SENSITIVITY is measured by "S-Fold Pliability Test." Immersion in oils and aromatic fuels followed by testing at extremes of temperature demonstrates the pliability of diaphragms made of Du Pont "Fairprene."

POROSITY of diaphragms of "Fairprene" to gases is tested by subjecting diaphragms to high air pressure under water. Absence of air bubbles indicates extreme pressures withstood by "Fairprene" coated fabrics.



FLEX RESISTANCE is shown by this flexibility test. Vibrator telescopes years of active service into hours, yet after this rugged treatment "Fairprene" diaphragm material shows no evidence of cracking.

Whatever you need in a diaphragm material ...you'll find in a Du Pont Fairprene® product

Manufacturers of gas meters are taking a close look at Du Pont "Fairprene" coated fabrics as a diaphragm material. And with good reason!

Diaphragms of "Fairprene" show exceptional resistance to the deteriorating effects of all types of gases—natural, manufactured, mixed gases and liquefied petroleum. Lightweight and flexible, these diaphragms withstand years of continuous service—even at extremes of temperature. "Fairprene" also shows exceptional tear strength, burst strength and resistance to loss of coating on exposure to the aromatic components of manufactured gases.

Almost any kind of diaphragm can be manufactured from "Fairprene"—along with hundreds of other industrial products. If you need a special gasket, seal, diaphragm or protective cloth in your plant—or to improve your product—it may pay you to investigate "Fairprene" coated fabrics. Du Pont engineers will gladly work with you in developing special grades of "Fairprene" to meet your own specifications. For further information about diaphragms of Du Pont "Fairprene" just clip and mail the coupon.

*"Fairprene" is Du Pont's trade-mark for coated fabrics, sheet stocks, and cements.

DU PONT INDUSTRIAL COATED FABRICS

E. I. du Pont de Nemours & Company (Inc.)
Fairfield, Conn.

DU PONT
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Mail coupon for further information . . .

E. I. du Pont de Nemours & Co. (Inc.)
Fabrics Division, G-610, Fairfield, Conn.

I am interested in "Fairprene" Industrial Products.

( ) Have a representative call.
( ) Send booklet "Coated Fabrics for Diaphragms."

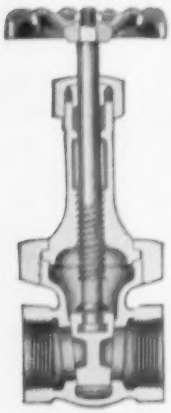
Name _____ Title _____

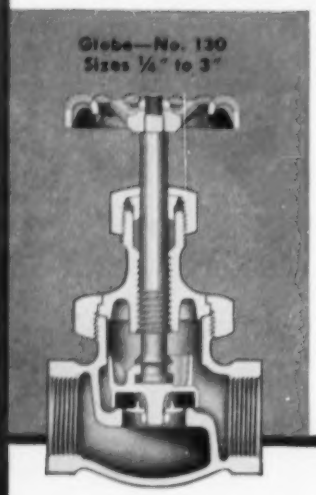
Firm _____

Address _____

City _____ State _____

Gate—No. 422
Sizes ¼" to 3"

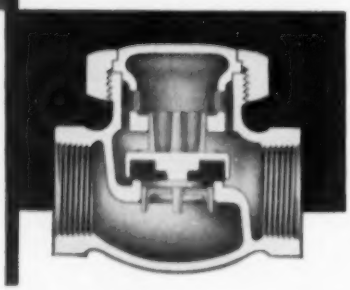




For consistent safety in L-P Gas handling... standardize on CRANE bronze valves

Angle—No. 131
Sizes ¼" to 3"

Check—No. 132
Sizes ¼" to 2"



In bulk plant, piping, on tank truck, or in customer installations—*safety* becomes a greater certainty when you use these Crane Bronze Valves in all LP-gas services.

Available at your local Crane outlet in globe, angle and gate patterns from ¼" to 3", and in check design from ¼" to 2", these rugged valves are completely approved by Underwriters' Laboratories, Inc.

To assure safer, more efficient handling of LP-gases—even under the severest service conditions—Crane Bronze Valves are *built* to stay tight. Globes, angles and checks are fitted with a snug, long-wearing, removable composition disc, cemented into the disc holder to insure tight seating. Crane gate patterns have a fully guided wedge disc that seats with precision and minimizes seating surface wear.

Standardize on Crane Bronze Valves for all your LP-gas handling. You'll be safer—and your customers will feel more confident. Ask your Crane Representative for complete details or write to address below.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

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If you are considering new facilities in the oil, gas, chemical or allied industries, you can get valuable assistance from Fish Engineering Corporation and subsidiary companies. At Fish, you will find some of the finest economists, engineers and construction men in the world. They are ready to work with you every step of the way from feasibility studies through engineering, financing, construction and operation.

HOUSTON, TEXAS

Fish Service & Management Corp. • *Fish Northwest Constructors, Inc.*

KEEP IT CLEAN...

by Phil Tration

Model CPHG
Gas Filter

The uses for Dollinger Filters are truly "elephantine" . . . any liquid, gas, or air can be efficiently and economically handled by them.

For example, if you want to remove dust from natural gas pipe lines, nothing does the job better than the *Model CPHG Gas Filter* illustrated at the right.

This filter provides exactly the desired filtration to completely eliminate dust problems and reduce customer complaints and service calls.

The Model CPHG, for natural gas filtration, is available in a wide range of sizes . . . pressures to 10,000 psi . . . to handle 100,000,000 cu. ft. or more per day.

Get all the facts . . . write for Gas Filter Bulletin 290R and technical article on Gas Filtration. Dollinger Corporation, 68 Centre Park, Rochester 3, N. Y.

DOLLINGER
STAYNEW FILTERS

LIQUID FILTERS • PIPE LINE FILTERS • INTAKE FILTERS • HYDRAULIC FILTERS
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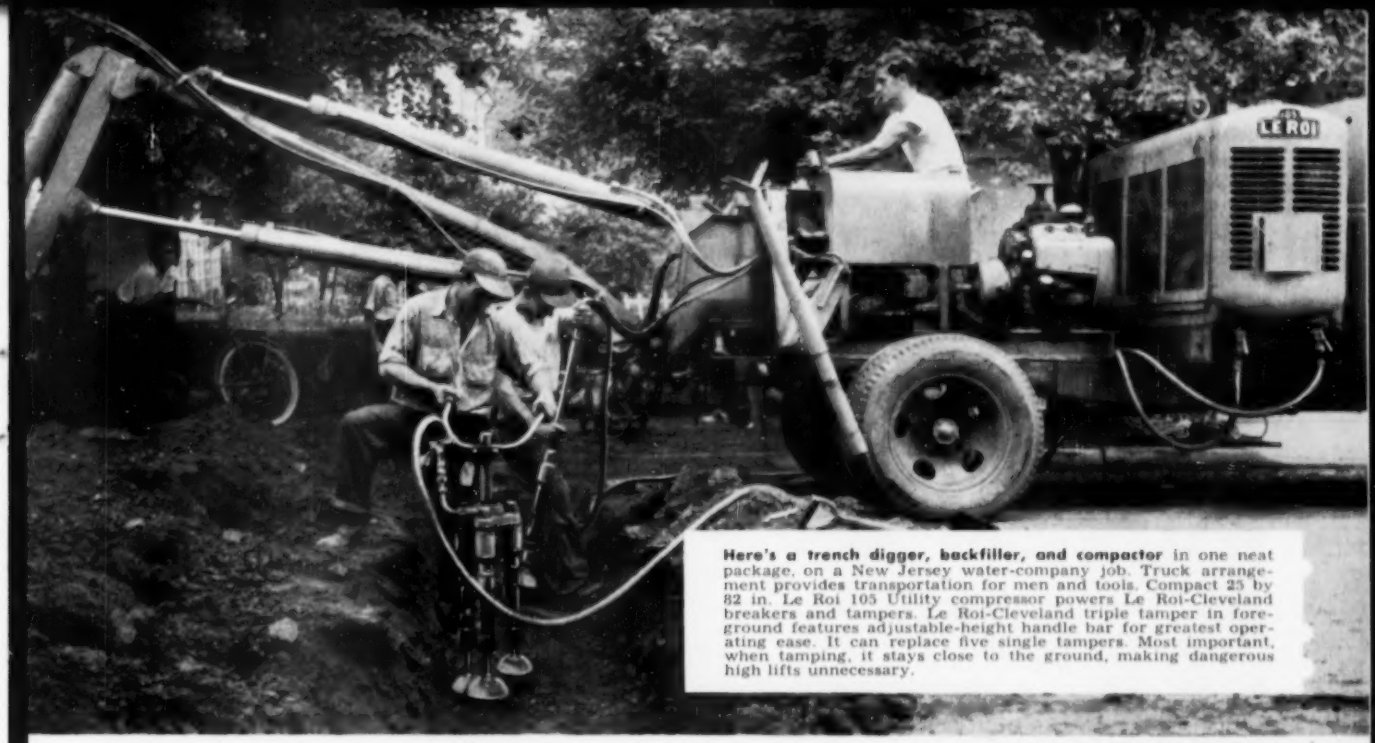
AUTOMATIC VENTILATION FILTERS • NATURAL GAS FILTERS • SILENCER FILTERS



Here's a trench digger, backfiller, and compactor in one neat package, on a New Jersey water-company job. Truck arrangement provides transportation for men and tools. Compact 25 by 82 in. Le Roi 105 Utility compressor powers Le Roi-Cleveland breakers and tampers. Le Roi-Cleveland triple tamper in foreground features adjustable-height handle bar for greatest operating ease. It can replace five single tampers. Most important, when tamping, it stays close to the ground, making dangerous high lifts unnecessary.

Work-Saving Air-Tool Applications

by LE ROI

Highway construction in Mexico is frequently for the birds, or literally could be as this picture indicates. Two operators pictured on this treacherous perch rely on easy-handling Le Roi-Cleveland sinkers, as do 38 others on job. To complicate the fatigue problem, this area around Chilpancingo is often subject to extreme heat. Sealed dust-proof feature is one reason why these tools produce the powerful, constant rotation needed for fast drilling.

On this $1,600,000 Cleveland sewer job, Le Roi-Cleveland clay diggers set a daily 20-ft. pace. The C-10 clay spade was chosen because a great deal of handling and lifting were required. Operators appreciated a well-balanced tool for this rush job. The spade also is free from bumps, so that operators can get a firm grip and still work close to tunnel walls.

Gas company employee breaks through tough 12-in. concrete. To speed emergency repair work, this utility chose the maximum shattering impact of a Le Roi-Cleveland 52 paving breaker. Work speed, however, was only one consideration. Low-cost operation was important too. The 52's piston air-cushion reduces internal part wear, makes handling easier.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

THE KEY PART

Just as the structure of this puzzle depends on *one* essential part, so can the IBM punched card serve as the key to *all* data processing for Public Utilities.

Making maximum use of your IBM punched card equipment not only gives you maximum efficiency *now*, it also helps prepare you for progress in electronic data processing *tomorrow!*

If your equipment is currently at work on less than 40 applications, there is room for profitable improvement. For a fresh look at *your* data processing picture, call your local IBM representative or send for these free illustrated folders—today! Write: PUBLIC UTILITIES DEPARTMENT A56, International Business Machines Corporation, 590 Madison Avenue, New York 22, N. Y.

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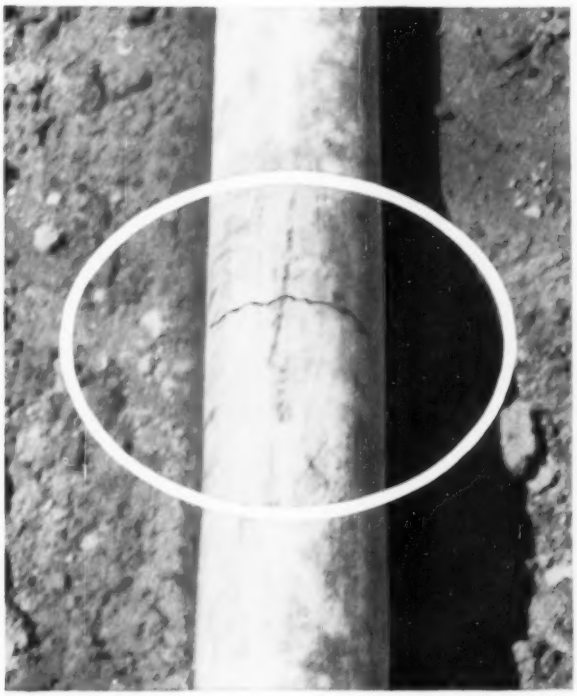
DATA PROCESSING · ELECTRIC TYPEWRITERS · TIME EQUIPMENT · MILITARY PRODUCTS

IBM DATA PROCESSING

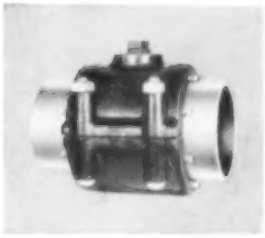
in 10 minutes...

PIPE BREAK TO PERMANENT REPAIR

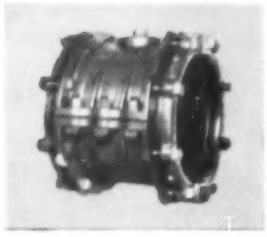


...ORDER NOW

FOR WINTER BREAKS!



Style 80—Ready-Pack Sleeve. Light weight, low cost. Insures gastight repairs, even on off-size pipe. Completely encloses the break. Fast, one-man repair on cast iron pipe from 3" to 8" diameter.



Style 57C—Cast Split Sleeve for longer breaks or splits in straight run of pipe. Quickly installed on cast iron pipe 2" to 12" diameter. Two or more sleeves can be joined to cover pipe breaks longer than 8".

Be ready to make quick, permanent, leakproof repairs if pipe breaks occur this winter. Order your Dresser Sleeve and Clamp assemblies now.

Each Dresser Style 80 Repair Sleeve comes completely assembled ready for installation and equipped with a handle for easy carrying to the trouble spot. Regardless of weather or location, one man using just a wrench can make a permanent repair on cast iron pipe in 5 to 10 minutes.

Here is "packaged repair" . . . a fast, modern technique insuring that pipe lines go back into full service immediately . . . another Dresser product designed to help you protect your investment and maintain the good will of your customers.

DRESSER®

ONE OF THE DRESSER INDUSTRIES

Dresser Manufacturing Division, 59 Fisher Ave., Bradford, Pa. Warehouses: 1121 Rothwell St., Houston; 101 S. Airport Blvd., S. San Francisco. Sales Offices in: New York, Philadelphia, Chicago, Atlanta, Denver. In Canada: Toronto and Calgary.

Tomorrow's Progress Planned Today

WELCOME AGA DELEGATES

AMERICAN GAS ASSOCIATION

1956
ANNUAL MEETING

Atlantic City, New Jersey
October 15-17

DRESSER salutes the members of the American Gas Association for their many contributions to the great progress of the gas industry.

THE DRESSER INDUSTRIAL TEAM SERVES THE GROWING OIL

the Dresser Badges of Merit plus+

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DRESSER MANUFACTURING DIVISION, Bradford, Pa.—Pipe line couplings, pipe repair sleeves and clamps, weldments, forgings, welding fittings, flanges, rings.

IDECO*

IDECO, Dallas, Tex.—Hydrair* and Power Rigs; Full-View* Masts; substructures; single, dual and Drive-In Rambler Rigs; blocks, swivels, rotaries; mud pumps; petroleum equipment and supplies.

LANE-WELLS

LANE-WELLS CO., Los Angeles, Calif., Houston, Tex., Oklahoma City, Okla.—Electric and Radioactivity Well Logging, Koneshot* perforating and bullet perforating, packers and bridging plugs.

Magcobar*

MAGNET COVE BARIUM CORP., Houston, Tex.—Magcobar* and Magcogel* drilling muds and other specialized oil well drilling fluids and chemicals.

PACIFIC*

PACIFIC PUMPS, INC., Huntington Park, Calif.—Centrifugal pumps for refineries, power stations, pipelines, and chemical plants; plunger pumps for oilwells.

ROOTS-CONNERSVILLE

ROOTS-CONNERSVILLE BLOWER DIVISION, Connersville, Ind.—Rotary positive blowers, gas pumps, centrifugal blowers, exhausters, vacuum pumps, and positive displacement meters.

Security

SECURITY ENGINEERING DIVISION, Dallas, Tex., Whittier, Calif.—Rock bits, reamer rock bits and hole openers; reamers, casing scrapers and Neo-Red rubber stabilizers.

SIE

SOUTHWESTERN INDUSTRIAL ELECTRONICS CO., Houston, Tex.—Seismograph systems and instruments—electronic, electro-mechanical. Computers—analog and digital; recording systems. Special transformers, reactors.

*Trademark registered

put this DRESSER plus+ family to work for you!

You receive a bonus of extra value whenever you are served by any one of the Dresser companies. Each Dresser operating unit provides the research, engineering, manufacturing and service applications for its particular specialties. *All* work together to provide the combined experience and facilities of the world-wide Dresser industrial team. This inter-company teamwork offers a bonus in greater experience and technical knowledge – backed by the extensive Dresser facilities – in the customer's specific industry. This intangible but important factor is known throughout the world as the Dresser plus +... the mark of superior equipment and services for the oil, gas, chemical, electronic, and general industry.

Dresser's world-wide engineering experience in many industries plays a major role in the creation of new developments and improved technological methods. No other single company provides the same broad range of equipment and services. The Dresser plus + is a symbol for the superior quality of equipment and technical services which have become the standard of comparison in industries the world over!

DRESSER INDUSTRIES, INC.

EQUIPMENT AND TECHNICAL SERVICES

OIL • GAS
CHEMICAL
ELECTRONIC
INDUSTRIAL

POST OFFICE BOX 718 • REPUBLIC NATIONAL BANK BUILDING • DALLAS 21, TEXAS

AS, CHEMICAL AND ELECTRONIC INDUSTRIES — EVERYWHERE

Need specialized help in any of these directions?

The modern approach to solving special operating problems is to call in specialized help. That way you don't divert your own key personnel from regular duties. You don't overburden your regular staff. And you save a maximum of payroll dollars. Backed by long experience in solving similar problems for gas companies throughout the United States and abroad, Ebasco gets to work promptly, gets the job done right and economically while your normal flow of routine operations continues.

Ebasco technicians are at your call anywhere and anytime you need them, for assignments large or small in any phase of manufactured or natural gas operations.

ENGINEERS · CONSTRUCTORS
EBASCO
BUSINESS CONSULTANTS

NEW YORK · CHICAGO · DALLAS
PORTLAND, ORE. · WASHINGTON, D.C.

COMPLETE ENGINEERING AND CONSTRUCTION SERVICES

In addition to assisting with operating problems, Ebasco offers a complete engineering and construction service for building new facilities or additions to present installations—from initial planning to actual operation of the plant or pipeline. A half century of experience in the gas industry stands behind this service.

For a complete outline of the services Ebasco offers, write for our booklet, "The Inside Story of Outside Help." Address: Ebasco Services Incorporated, Dept. F, Two Rector St., New York 6, N. Y.

Made of malleable iron. Single massive bolt. All sizes, 1/2" to 12" inclusive. For steel, cast iron and Transite pipe.

M. B. SKINNER COMPANY

SOUTH BEND 21, INDIANA, U.S.A.

SKINNER-SEAL SERVICE SADDLE

ANNOUNCING

2 GREAT PRODUCTS TO SAVE HIM

OIC PLUG VALVES & AMERICAN METER

An unbeatable gas flow-control and measurement combination

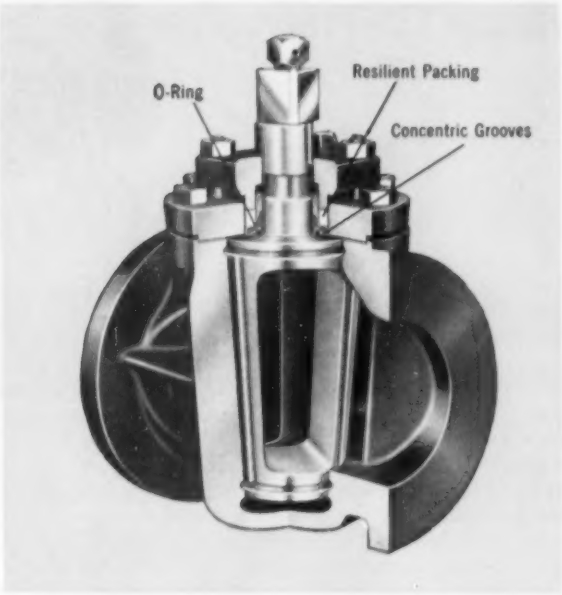
OIC's exclusive, triple-seal lubricated plug valve design is a perfect complement to the dependable quality of American Meter's top line of measurement and control equipment.

OIC VALVES

FORGED & CAST STEEL, LUBRICATED PLUG, BRONZE & IRON VALVES

JOIN FORCES

MAINTENANCE TROUBLES



Exclusive OIC triple seal ends shank and gland leaks . . . retains adjustment

Concentric grooves form a *labyrinth seal.* Gland liner also retains an *O-ring*—a second seal. *Resilient packing* forms a third seal, is completely isolated from all moving parts.

These three seals act separately from the valve's lubrication system to prevent gland and shank leakage. Lubrication in grooving surrounding body ports, plus lube film on body and plug surface provides a positive seal between plug and body.

Maintenance-free metering to fit your needs

Make your choice from American Meter, the only manufacturer of a complete line of precision measurement and control equipment for the gas, oil and chemical industries. And now American Meter serves you even more completely, offering you the OIC line of lubricated plug valves stocked at strategic locations for prompt delivery.

Ironcase

Welded Steelcase

Aluminumcase

Tinned Steelcase

AMERICAN®
METER COMPANY
INCORPORATED ESTABLISHED 1892

GENERAL SALES OFFICE: Somerton, Philadelphia 16, Penna.
Albany · Alhambra · Atlanta · Baltimore · Birmingham
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Omaha · Pittsburgh · San Francisco · Seattle · Tulsa · Wynnewood
IN CANADA: Canadian Meter Company, Ltd., Milton, Ontario
Calgary · Edmonton · Regina

SUPPLIERS TO THE GAS INDUSTRY for Ironcase, Tinned Steelcase, Aluminumcase and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments • Reliance Regulators • Provers • Apparatus

MAKES SERVICE INSTALLATIONS
GO FASTER AND EASIER

Tubing of Tenite is easy to handle

Tubing of Tenite Butyrate plastic is extremely light in weight. An average service length of 70 feet weighs less than four pounds, making it far easier for your men to handle.

There are many other advantages of tubing made of Tenite Butyrate plastic. It resists corrosive soils and electrolytic attack; joints need no asphalt protection. Lengths can be joined easily with solvent cement and slip-sleeve couplings. And readily available adaptors connect the tubing quickly to all metal pipe.

Replacing corroded metal service line is easier with this tubing, too. Trenching is eliminated. Holes are dug only at the main tap and the service riser, and the tubing is run right through the old pipe.

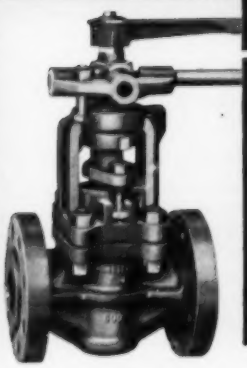
Since 1943, tubing of Tenite has been helping utilities save money by cutting original installation time and reducing maintenance costs. You can obtain these same advantages for yourself. Write for the names of distributors near you handling tubing of Tenite Butyrate. Ask, too, for literature describing the tubing, its fittings, and installation methods in gas service applications. Address: EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

A 16mm. sound-color film, "PLASTIC PIPELINES," is available upon request.

TENITE
BUTYRATE
an Eastman plastic

if your problem is...

- TEMPERATURE
- PRESSURE
- CORROSION...



HOMESTEAD *Lever-Seald* **PLUG VALVES** *will solve it...*

Conditions which cause ordinary valves to fail --corrosive, erosive, viscous, or volatile hard-to-hold fluids, plus temperature or pressure extremes --are everyday jobs for Homestead Lever-Seald Valves. Why? Because they *are built to operate under all conditions!* They never stick!

Every Homestead Lever-Seald Plug Valve has a powerful lever and screw device that does double duty. It presses the tapered plug firmly into its seat to form a drop-tight seal, and also provides a positive means to relieve seating pressure and permit easy operation.

Lever-Seald Homestead Valves give extra long, leak-proof service, too, because all operating parts and seating surfaces are protected from line fluids in both the open and closed positions. You can prove their economy to your own satisfaction, by making your next replacement a Homestead Lever-Seald.

Your choice can be made from valves cast of metals and alloys to specification in sizes from 1" to 12"; for pressures from vacuum to 1500 pounds; temperatures from 40° below zero to 1100°F. Dry seat or pressure gun lubricated optional.

You'll find our VALVE REFERENCE BOOK No. 39-3 interesting and helpful. It's yours for the asking.

MAIL THE COUPON TODAY!

Without obligation, send me Valve Reference Book No. 39-3 describing Homestead Lever-Seald Plug Valves.

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Company _____

Address _____

City _____ State _____

HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. BOX 405 *"Serving Since 1892"* CORAOPOLIS, PA.

Radio speeds customer service, controls maintenance, for United Fuel Gas Company

United's transmission department has 100 radio units, handles line responsibility up to the city gates of the distribution system. Hook-ups, pipe line maintenance, flow checks, are instantly controlled by G-E 2-way radio.

First G-E Progress Line Radios Join System Serving 257,000 homes in Charleston, W. Va. area.

One hundred twenty two mobile units and two base stations, in service with the United Fuel Gas Company, Charleston, W. Va., are equipped with G-E 2-way radio. United was the nation's first firm to incorporate new Progress Line units into their radio-equipped fleet.

United's system uses an efficient combination of high and low band units. Meter installations, service calls, line flow and maintenance, over hundreds of pipe line miles are efficiently supervised by radio. Two base stations serve the 122 mobiles, dispatch orders and equipment.

Daily, over West Virginia's notably hilly terrain, crews are reporting radio contacts in formerly unworkable areas.

United's radio technicians look forward to the benefits of complete interchangeability in the G-E Progress Line. Individual receiver, transmitter, and power supply are plug-in units capable of either 6 or 12 volt power operation. Service and maintenance costs are reduced, system flexibility is greatly increased. It's possible to switch chassis in one set, or switch sets from one vehicle to another—with minimum time and effort. In addition, United has experienced phenomenal tube life with their Progress Line equipment.

Let a G-E Communications Counselor discuss your radio needs with you. He'll tell you how your operation can take advantage of the new G-E Progress Line—and save money on long-range planning. Call him in today. Or, write to the *General Electric Company, Communication Equipment, Section X13106, Electronics Park, Syracuse, New York.*

Service calls in record time. Customer service is handled by 22 trucks with G-E mobile units. Meter installation, checking, and emergency repairs are coordinated by 2-way radio.

One of United's two G-E equipped base stations in the Charleston headquarters. Distribution department service and Transmission line crews are served by separate base stations. With the new General Electric Progress Line, vehicles are back in service faster. Transmitter, receiver, are plug-in chassis and can be replaced in the vehicle quickly.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Crew unloading gas pipe from full-length tunnel in 7102C. Three vertical and one horizontal compartment with optional inserts are contained on the right side.

Comfortable 4-man crew compartment contains sliding windows with air scoops, spring seat and folding shelf. Bodies can be furnished with compartments made to order.

PIPE "DREAM" MADE TO ORDER...

. . . just the way you want it, depending upon the amount and type of gas line construction work you handle. This "dream" body, Series 7000, is a new idea in utility body design. You specify what you need in the way of compartments, adjustable bins, drawers and separators and Holan engineers will modify the design to your specifications. In other words, you get a "custom" body at less cost!

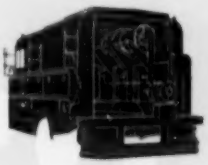
Basic sizes in the 7000 series accommodate chassis from 60″ to 102″ C.A. dimension. Crew compartments and roof enclosures are optional. Every size body is equipped with a full-length front-to-rear pipe tunnel. You even have the option of buying compartment inserts knocked-down for assembly in your fleet garage.

This is truly the opportunity gas companies have been waiting for—the chance to buy quality at limited-budget prices.

You can *now* buy Holan, the name that *means* work simplification, at a price that fits your purse.

Write for catalogs and price information on Holan 7000 and 7000C Bodies.

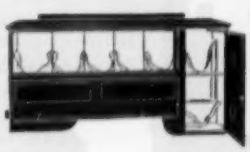
Air compressor bodies with hose reels in rear compartments.



Air compressor bodies with left handed compartments and air winch for backfilling.

Air compressor bodies with pipe compartment and provisions for oxygen and acetylene tanks.

Air compressor with skid-mounting and independent gasoline engine.



General service bodies with special gas meter compartments.

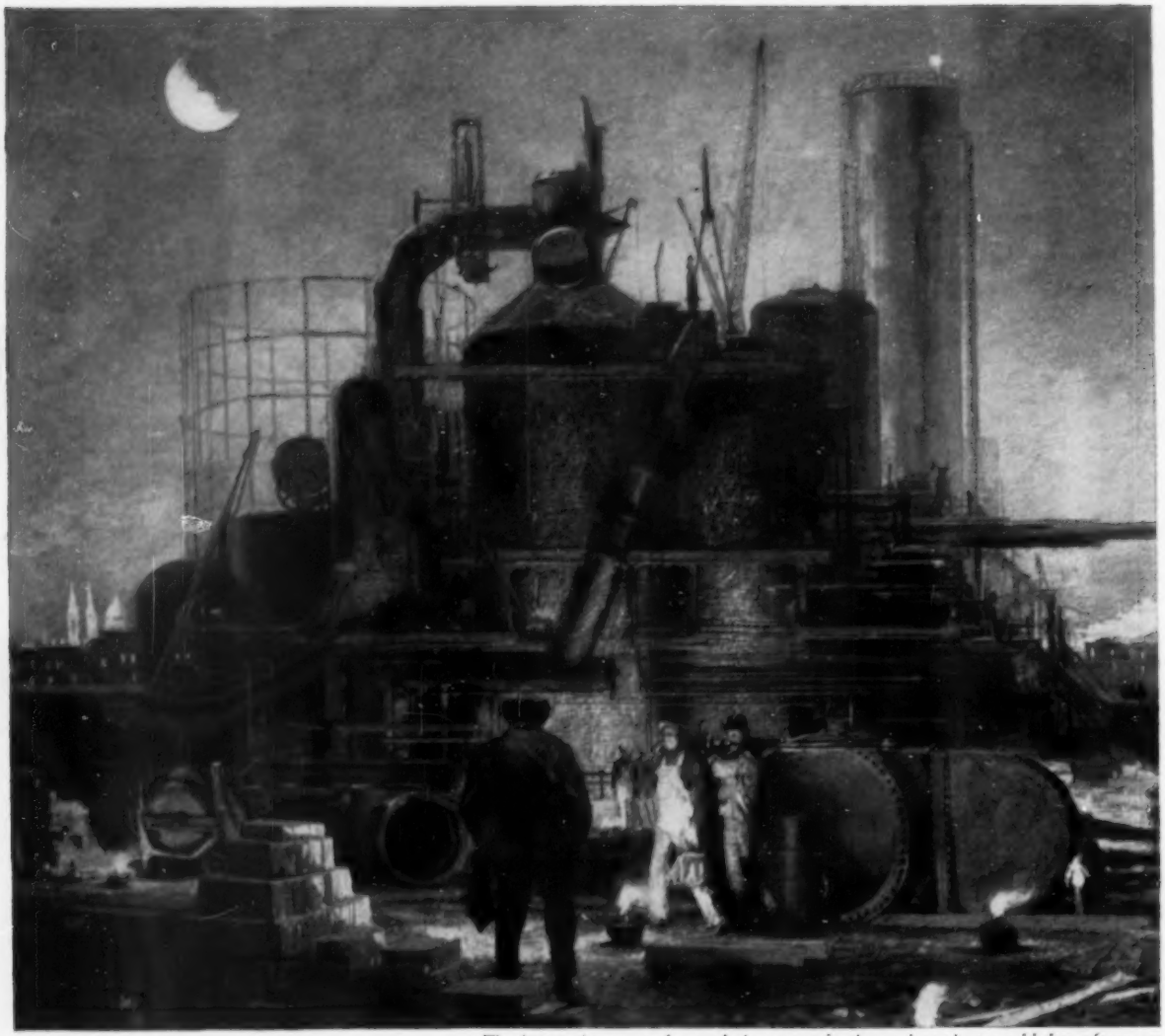
Service bodies for chassis up to 1½ tons. Lengths 72″, 75″, 84″, 90″ and 102″. Optional compartment arrangements.

J.H. HOLAN CORPORATION

4100 WEST 150TH STREET
CLEVELAND 11, OHIO

OTHER PLANTS:
HOLAN CORPORATION OF GEORGIA, Griffin, Ga. • J. H. HOLAN CORP., Phoenix Div., Arizona
BRANTFORD-HOLAN LIMITED, Brantford, Ontario

THE NAME THAT MEANS WORK SIMPLIFICATION



The impressive mass of a catalytic gas production unit against a cold, late afternoon sky, firebrick, valves and a maze of giant pipes help artist Stanley Meltzoff tell the story of growth and expansion in America's big and important gas industry.

United Engineers is pioneering in the development of today's finest gas production processes and equipment. For example, the U.G.I. Cyclic Catalytic Reforming (CCR) Process is being advanced through further work in reforming heavy oils and the construction of new, larger size, higher capacity apparatus. Recent operations on U.G.I.-Hall regenerative oil gas apparatus have resulted in substantially increased capacities. Development work is continuing on processes for the production of gas and petrochemicals from heavy oils and coals. Fluidized bed processes have excellent application in this field.

In addition, as designers, construction managers, and engineering consultants, we have the experience and sound understanding of gas production and handling requirements gained through many major projects such as pipelines, distribution mains, natural gas construction, synthesis gas and other gas manufacturing installations, and general gas plant construction.

Best proof of the flexibility, scope and economy of our engineering skills—and of the satisfaction of our clients—lies in the fact that more than 90% of our work is on projects for those we have previously served.

Our background of more than 70 years' experience is your assurance of getting the maximum return for each construction dollar expended. We invite you to share this experience.

UNITED ENGINEERS

& Constructors Inc

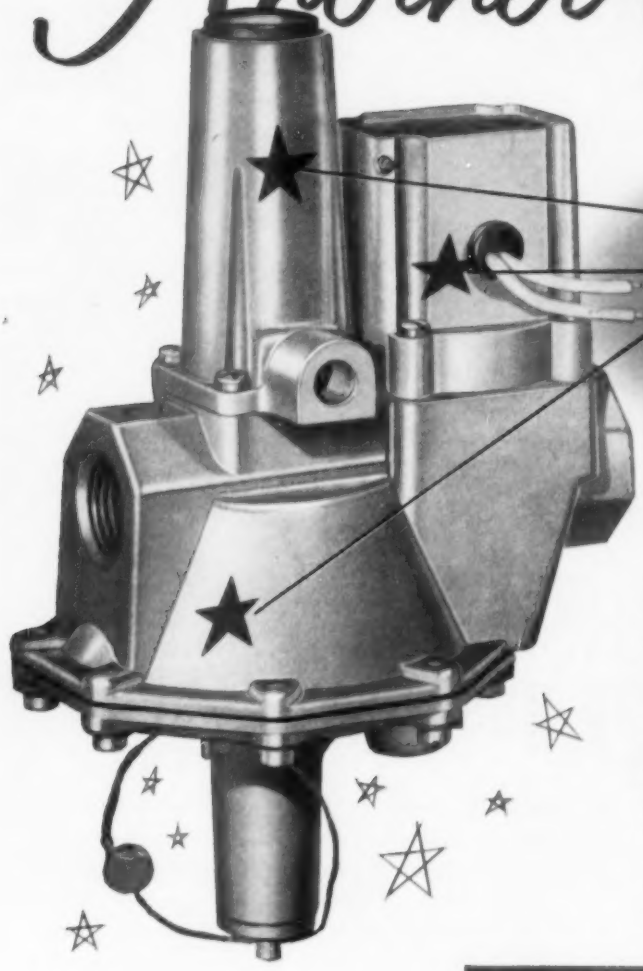
U.E.&C. (Canada) Ltd.

New York 17 • PHILADELPHIA 5 • Chicago 2

Our list of clients includes many of the nation's forward-thinking utilities and industries

Another BASOTROL VALVE SERIES with

BASO® Automatic Pilot
BASOTROL Magnetic Valve
PRESSURE REGULATOR
IN ONE UNIT



The new Basotrol valve series includes in one compact unit a Basotrol magnetic valve for automatic main gas control, a Baso automatic pilot for safe lighting and main burner shut off, and a pressure regulator.

The Basotrol magnetic valve section will not become permanently magnetized to stick in the open position. It is spring loaded, provides strong closing and sealing forces, is quiet, and has a molded rubber valve disc. The valve is available in two voltage types for 115 volt and 20 volt, 60 cycle, a.c.

The reliable Baso automatic pilot is thermocouple operated and prevents gas reaching the main burner during the resetting cycle. The Baso valve snaps closed if the pilot burner should be extinguished, shutting off gas from the main burner.

Both the Basotrol magnetic operator and the Baso automatic pilot assemblies are replaceable in the field.

CAPACITY

MODEL	INLET AND OUTLET	OUTLET PRESSURE RANGE		PRESSURE DROP CAPACITY @ 0.3 W.C.	REGULATION CAPACITY	
		MAX.	MIN.		MAX.	MIN.
GAW3A1 GAW3G1	⅜"	4"	2"	53,550	92,000	10,000
GAW4A1 GAW4G1	½"	4"	2"	56,350	92,000	9,200
GAW9A1 GAW9G1	½"x⅜"	4"	2"	53,550	92,000	10,000
GAX4A1 GAX4G1	½"	4"	2"	67,210	120,000	45,000
GAZ4A1 GAZ4G1	½"	4"	2.1"	60,000	110,000	15,000
GDX4A1 GDX4G1	½"	4"	2"	75,950	143,000	20,000
GDX5A1 GDX5G1	¾"	4"	2"	83,600	153,000	20,000

MILWAUKEE GAS SPECIALTY CO. • Dept. SC-2, Milwaukee 1, Wis.

Meter installation. With its 4-wheel drive traction, the Universal 'Jeep' goes anywhere—through mud, sand and fresh fill—to deliver men, tools and equipment to the job. In new construction areas, the 'Jeep's' extra traction is your assurance that installation and service are always on schedule.

Only 4-Wheel-Drive 'Jeep' vehicles fit so many gas service needs!

Trenching. Digging trenches for service lines is a fast, efficient operation with this 'Jeep'-propelled trencher. It digs up to 800 feet per hour and up to 14 inch widths and 6 foot depths—travels speedily between jobs.

Service vehicle. The "go-anywhere" ability of the rugged 4-Wheel-Drive 'Jeep' Truck makes it ideal for transportation—for service installations, repair crews and equipment, on or off the road, in any weather.

Whether it's following a pipeline cross-country or transporting men and supplies to new construction areas, 'Jeep' 4-Wheel-Drive vehicles are proving their value every day in virtually every phase of the gas industry. With the extra traction of their 4-Wheel-Drive, they go almost anywhere: deliver men, power and tools in emergencies—speed over roads or patrol where there are no roads—through mud, sand, snow or up rocky grades. They shift quickly into conventional 2-wheel drive for travel at highway speeds. And with power take-off they operate welders, compressors, generators and other special equipment. See your Willys dealer for a demonstration, or write for information.

The 'Jeep'®

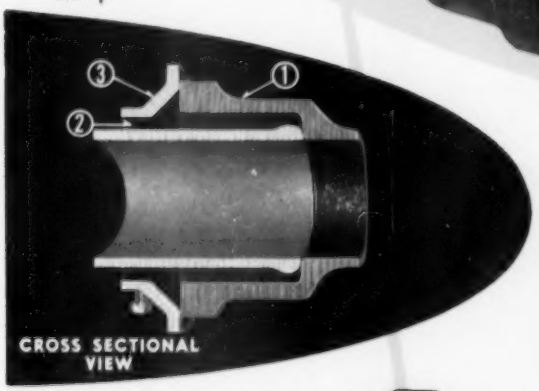
family of 4-Wheel-Drive vehicles

WILLYS...makers of the world's most useful vehicles

WILLYS MOTORS, INC., TOLEDO 1, OHIO

Simplified Bell Joint Clamps

1. Bell joint
2. Perma-Seal Compound
3. Bell joint clamp



SEALED BY ADHESION

WITH PERMA-SEAL COMPOUND

WITH THE FOLLOWING ADVANTAGES:

- Smaller street openings required because no excavating or cleaning necessary in back of the bell.
- The clamp does not require adjustment, or filling and facing of the bell.
- ***The clamp is engineered to fit all variable pipe wall thicknesses without adjustment and to fit all types of bell joints including sleeves, drip pots, valves and odd size pipes.*** Available sizes: 3" to 36" diameter.
- This clamp fits in confined areas because it requires no greater area than the existing bell for installation.
- ***This leak clamp becomes a seal by adhesion rather than by compression.***
- This clamp allows ground movement and vibration to take place without the danger of leaks after installation.
- Once installed the joint becomes trouble-free and permanent.

Write: for full information and prices about the Newest Method in Pipe Connections

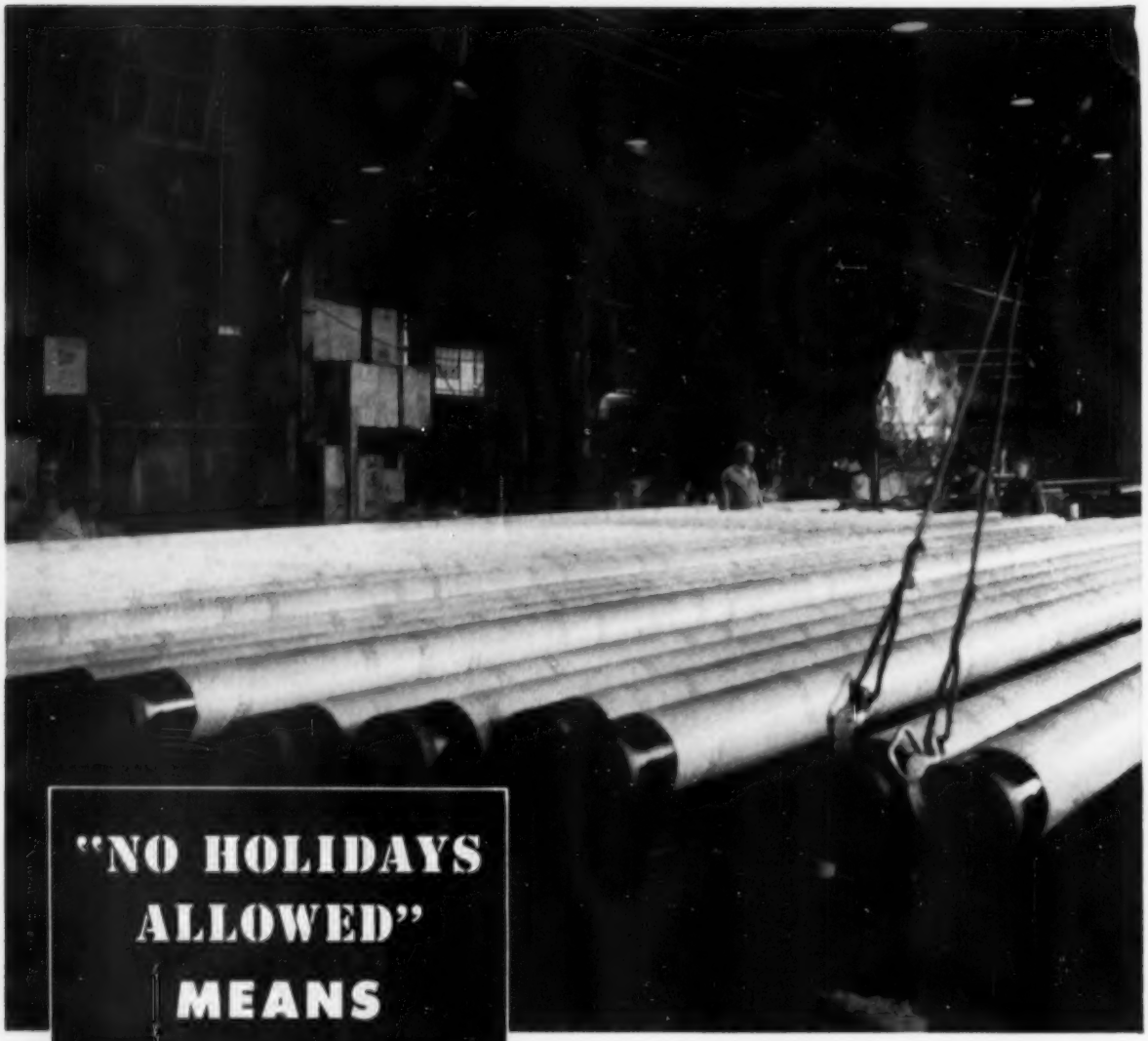
New Perma-Seal and Safety Seal Weld sleeves available for steel to steel, steel to cast iron, split sleeves for repair of steel pipe, and completely insulated sleeves for corrosion control.

Typical installation in the removal of valve and replaced with safety seal weld sleeves.

Steel to steel sleeve

Cast to cast sleeve

UNITED PIPE UTILITY SUPPLIERS, INC. BOX 777, BELOIT, WISCONSIN



"NO HOLIDAYS ALLOWED" MEANS BETTER PIPE PROTECTION!

When is a holiday not a vacation? When it's an imperfection in the coating and wrapping. Such a weakness cannot possibly escape detection at Hill, Hubbell. For in a final step, all Hill, Hubbell processed pipe goes on inspection skids as shown above. Then each square inch is carefully examined by an electronic Holiday Detector before the pipe leaves the plant. One of many quality controls developed by Hill, Hubbell, the use of Electronic Holiday Detectors is simply—

Another "first" pioneered by the first name in pipe protection

FACTORY APPLICATORS OF COATINGS AND WRAPPINGS

HILL·HUBBELL & COMPANY

DIVISION OF GENERAL PAINT CORP. • 3091 MAYFIELD ROAD, CLEVELAND 18, OHIO

Built to "take it," this low-cost Barber-Greene Ditcher cuts the cost of digging narrow trenches . . . proves that hand digging is no longer economical, even on the smallest jobs.

Digging from house to main at less cost than ever before

When laying pipe for service lines and other installations, utilities and contractors have had to contend with the high cost of digging and backfilling the required trenches.

The new Barber-Greene 702 Ditcher has solved this problem. Despite its small size, the 702 is the newest machine in the most rugged line of ditchers made.

Prior to this new development, available machines either dug too wide for practical and economical operation, or did not have the stamina and digability required for coping with unfavorable conditions.

Utilities, contractors and railroads are now gaining the advantages of underground lines and services in virtually every area of the country.

Applications, to date, include electric power and telephone lines and house services, railroad signal systems, traffic control systems, outdoor theater wiring, installations of small gas and water lines and services, lawn sprinkling systems and others.

Digs to 40" deep, 5" wide. The 702 can be easily towed or carried on a light truck. Simple-to-operate dual controls permit operation from seat or from side of machine for full view of trench.

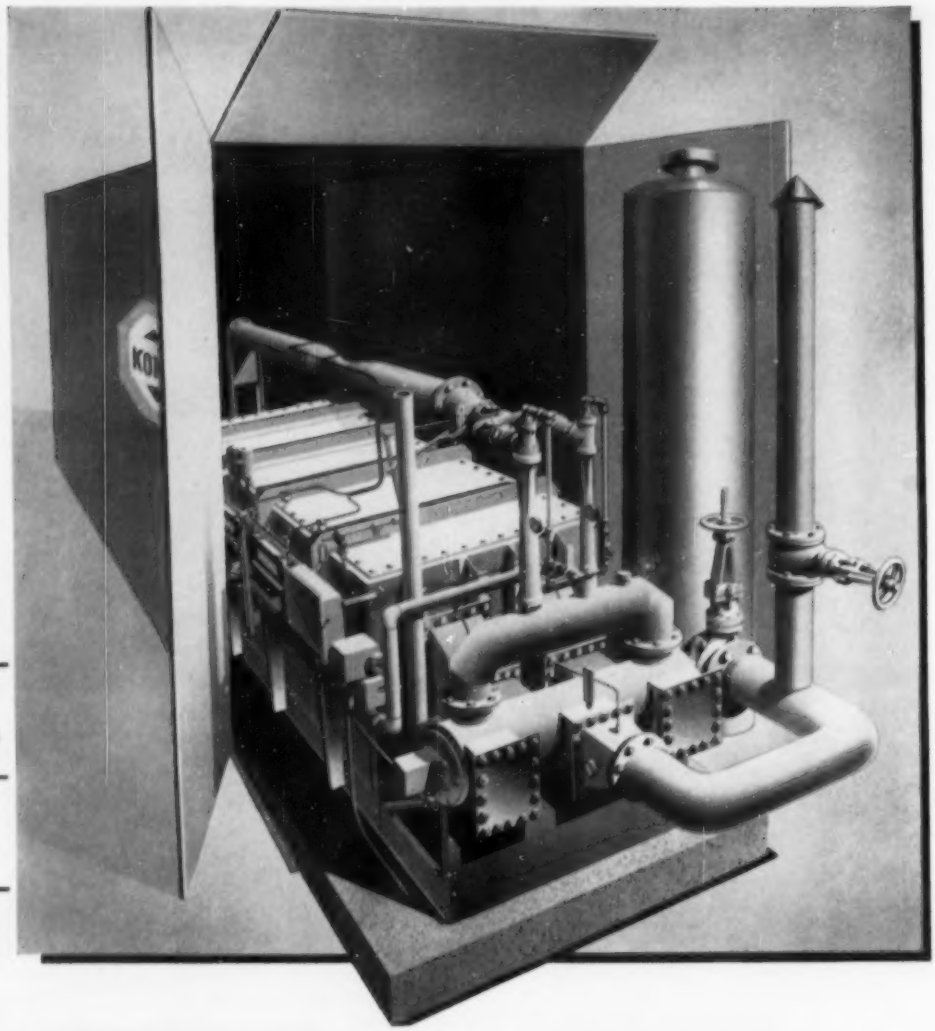
Write for literature on this important, new, low-cost ditcher

56-30-D

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



Unexpected peak load?

Gas supply emergency?

Pipeline breaks?

Compressor failure?

The Koppers-Hasche Reformer is low-cost insurance!

• For utilities that distribute manufactured or natural gas

The Koppers-Hasche Reformer produces low-cost gas that is interchangeable with most natural and manufactured gases. Available in a standardized "package" unit—which means low installation cost—this furnace *meets emergencies.*

Whether it's a case of keeping up with demand, carrying on until repairs are made, or giving you inexpensive base load production . . . this automatic Koppers-Hasche Reformer offers a low intitial cost, low operating cost (it requires minimum operating supervision), and low maintenance cost (there are few moving parts).

Let Koppers engineers, recognized authorities in the gas industry, tell you how the Koppers-Hasche Reformer eliminates production interruptions due to gas supply failure, swings into action when emergencies arise! For complete information write to: KOPPERS COMPANY, INC., Gas Apparatus Dept., 4010 Scott Street, Baltimore 3, Md.

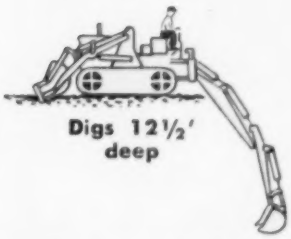
KOPPERS®

KOPPERS-HASCHE REFORMERS

METAL PRODUCTS DIVISION • KOPPERS COMPANY, INC. • BALTIMORE 3, MD. This Koppers Division also supplies industry with Fast's Couplings, American Hammered Industrial Piston & Sealing Rings, Aeromaster Fans, Industrial Gas Cleaning Apparatus. Engineered Products Sold with Service.

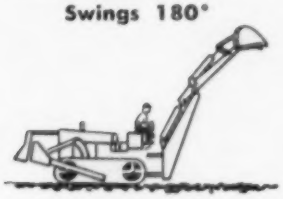
Compare TerraTrac's 12 exclusive features before you buy <u>any</u> backhoe!

Reaches 18'



Digs 12½' deep

Swings 180°



Dumps 13' high

One look at TerraTrac's husky welded steel box-section boom and dipper stick tells you this rugged crawler-mounted backhoe is *really built for heavy-duty trenching and excavating.* It reaches further, digs deeper, dumps higher, has a wider swing-angle than any other tractor-hoe in its price range. But that's not all. This new TerraTrac unit also has *far more power and speed for tough digging.*

Big 50 HP industrial engine with torque-converter drive, plus 30 GPM hydraulic pump...bigger boom and dipper cylinders...*exclusive foot-pedal swing control*... really make the dirt fly. In addition, 1482 sq. in. of track on the ground, combined with individually controlled stabilizers lets you work in soft or rough terrain where rubber-tired rigs can't go...gives you *much better stability and balance,* so you can dig tough materials without danger of being pulled into the hole.

Even more important, the COMPLETE TerraTrac unit — tractor, backhoe, and front-end loader or dozer — is *designed, built and fully warranted by ONE manufacturer* — is available with handy low-cost tilt-trailer for fast job-to-job moves. Sound interesting? Use coupon for quick action.

CLIP . . . MAIL FOR FREE CATALOG

TERRATRAC®

. . . Performance leader in medium-size crawler tractors and equipment

American Tractor Corp., Box 659, Ft. Wayne, Ind.

☐ Send free catalog on new TerraTrac Backhoe
☐ Have nearest dealer representative call

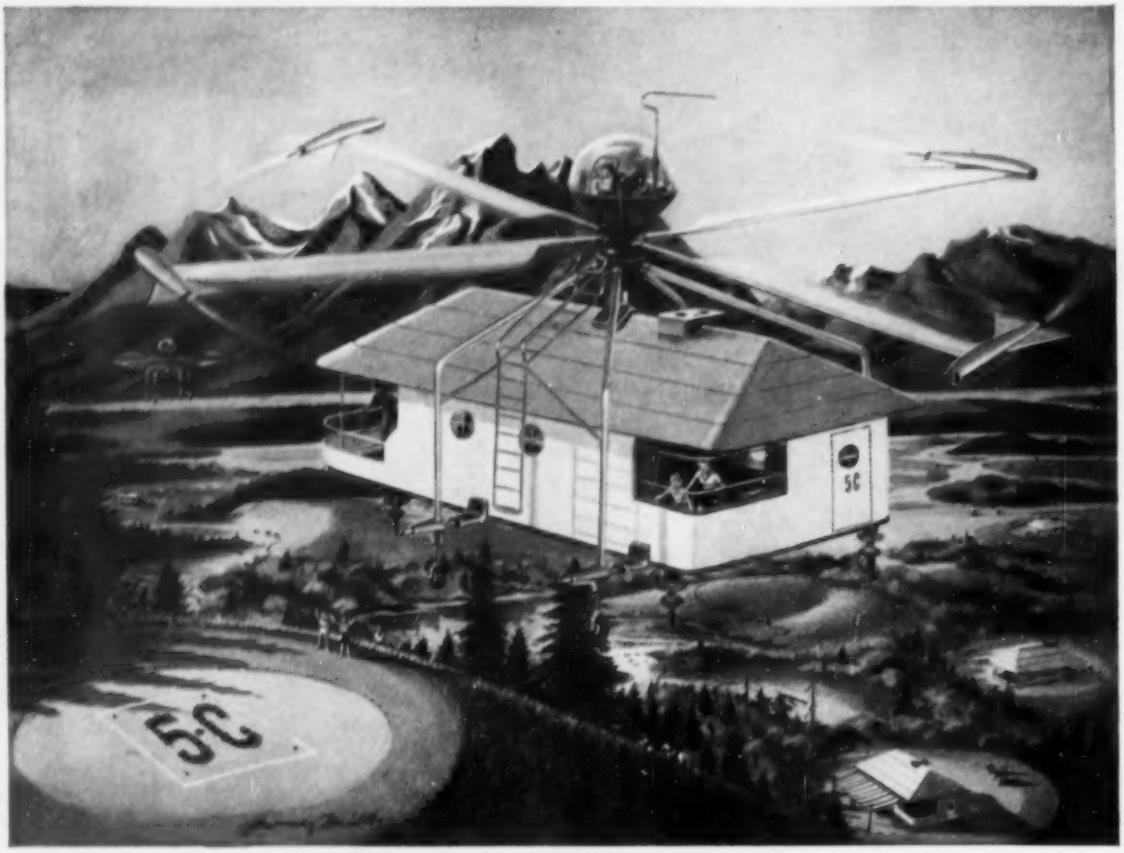
Name ..... Position .....

Company .....

Address .....

City ..... State .....

IT-8-98



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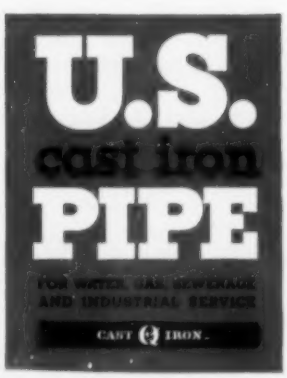

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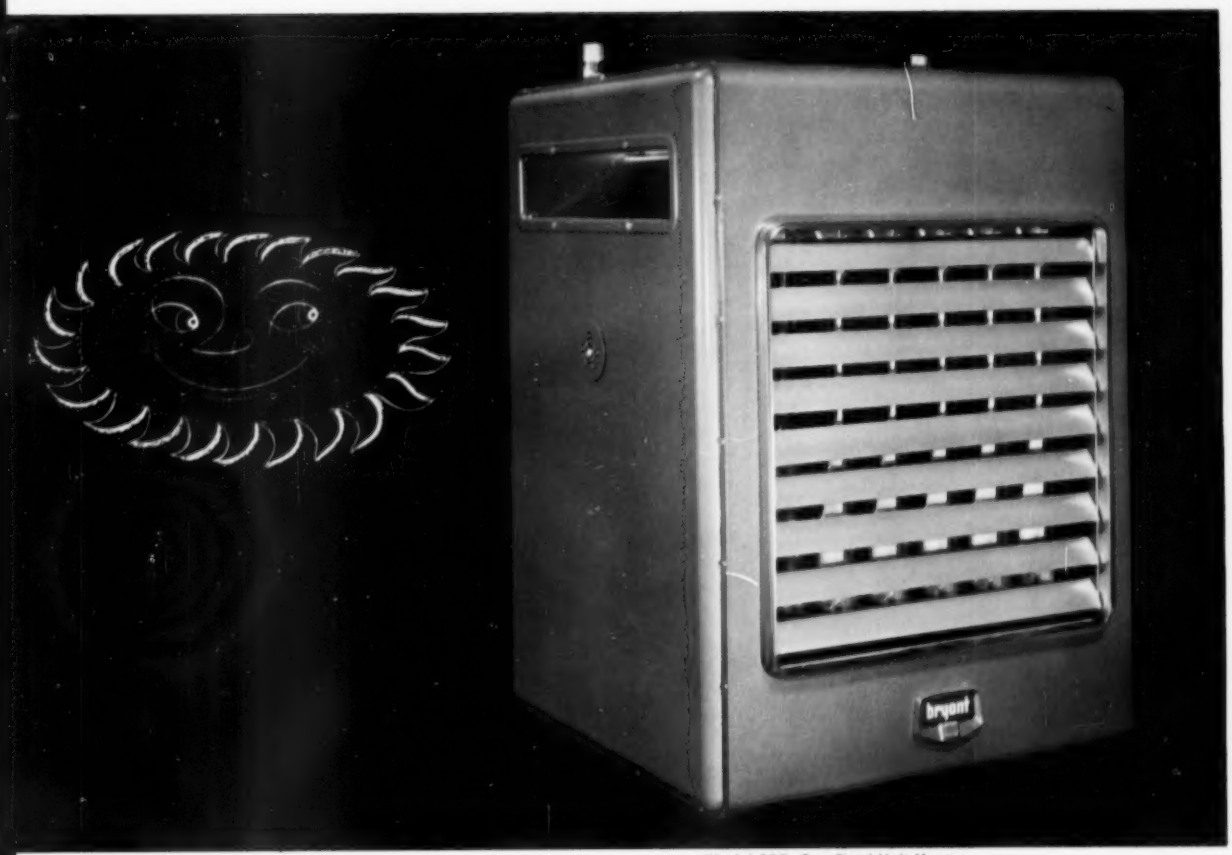

Model 327, Gas-Fired Unit Heater

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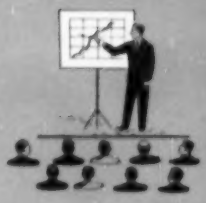

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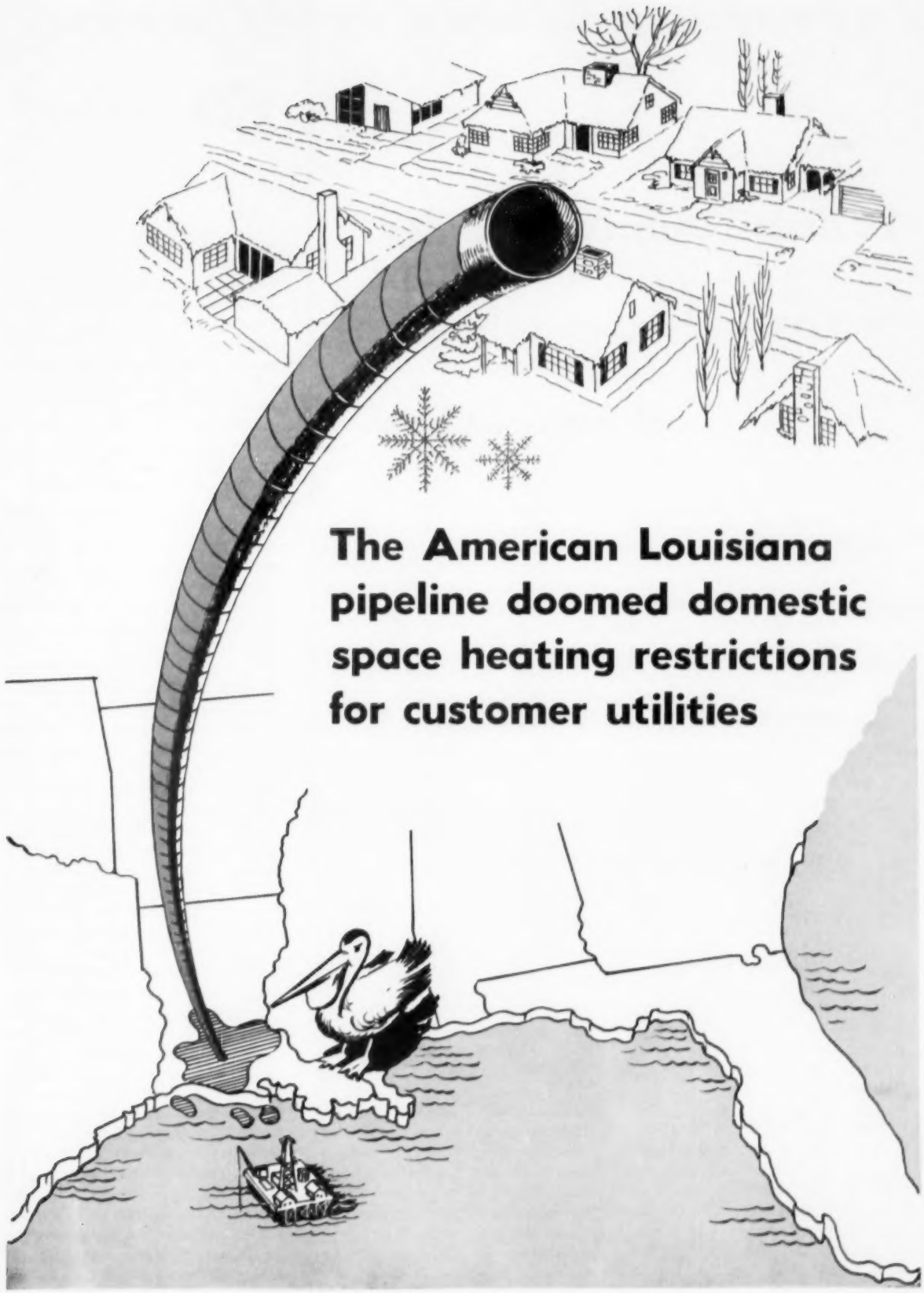

The American Louisiana pipeline doomed domestic space heating restrictions for customer utilities

GAS staff report

16 distribution companies receive increased volumes of natural gas

As long ago as 1952, distribution companies in the Midwest began expanding their systems to handle the additional supplies of natural gas that the American Louisiana pipeline delivers. The new line will solve the gas supply problem in Michigan, Wisconsin, and parts of Iowa and Missouri for years to come.

●

By J. FRED EBDON, *Editor*

SLIPPING through the swamps of Louisiana and northward through a corner of Arkansas before passing into, and, through, Mississippi, Tennessee, Kentucky, Indiana; on northward through Ohio's northwest corner, and to a terminal point near Detroit, Mich., the American Louisiana Pipe Line Co.'s new 30-in. natural gas transmission line brings additional energy to the heart of America's heavy industrial area. The tubular steel conduit forms a bisector of the nation. Its path separates the eastern and the western United States, in the philosophy of the people, more cleanly than does the Mississippi river. In addition, it joins the Gulf Coast with the Great Lakes. But far more important than the geographical concept of the pipeline is the fact that it will indirectly serve the entire nation through its ability to supply fuel for the many domestic requirements and for industrial applications, in one of the nation's most important manufacturing areas.

The pipeline was built to supply natural gas in Michigan, Wisconsin, and parts of Missouri and Iowa. The demand for additional energy from increased natural gas supplies has been tremendous in these states during the past several years. Huge gas reserves near the quiet, warm waters of the Gulf of Mexico will be brought to this natural gas-hungry area by the new American Louisiana pipeline. It will solve the gas supply problem in this area for years to come.

The American Louisiana pipeline is modern in design and concept. New materials have gone into the construction. New concepts of service and operation have been established. It takes a place among the really modern natural gas pipelines by being expanded in major proportions before the original pipeline was completed. Thus, American Louisiana joins the dynamics of present gas industry plans and projects. Expansion, ever expansion, is the key word in America's natural gas industry.

System organization

The American Louisiana Pipe Line Co. is the newest subsidiary of the American Natural Gas Co. The parent organization was formed at the turn of the century as one of the first public utility holding companies. American Natural's scope of interests have ranged through manufactured gas, electricity, and transit utility operations. In 1949, it became an integrated natural gas system. Today, American Natural Gas Co. provides natural gas service for more than 4.8 million people. Two large distribution companies; an interstate Texas-Panhandle-to-Michigan-and-Wisconsin pipeline; extensive terminal-end underground storage fields; and now the new *American Louisiana Pipeline*, make up the integrated gas system.

American Natural's operating companies

MICHIGAN CONSOLIDATED GAS CO.

MICHIGAN Consolidated is a distribution company with more than 800,000 customers in Detroit, Grand Rapids, Muskegon, Ann Arbor, Ypsilanti, and many other communities in Michigan. Limitations on gas supply to this utility have resulted in restrictions on the connection of new domestic space heating customers since 1950. More than 100,000 unsolicited applications for space heating were on file at the end of 1954. This condition existed in spite of the fact that in October 1953 the Michigan PSC authorized 9600 additional space heating customers and permitted another 14,000 addition in August 1954. These 23,600 heating customers were added by the end of 1954.

The new heating load could be connected because Michigan Consolidated developed limited terminal underground storage at the Six Lakes fields. Several billion cubic feet of natural gas are in place there to meet emergencies. The construction of the American Louisiana pipeline permits utilization of the underground storage reservoir to its maximum capacity. In 1954, it was anticipated that no new heating customers would be served until the additional gas supply from American Louisiana was available.

During the 1955 construction season, progress on the installation of the American Louisiana line was satisfactory to the point where Michigan Consolidated began connection of 78,000 additional heating customers. This program was started in September and, by the end of 1955, about two-thirds of the backlog desiring this service were connected.

Gas for the new heating customers was available from the underground reservoirs of the Six Lakes storage field during the heating season of 1955-56. Storage natural gas was augmented by 6 billion cu ft of excess gas that became temporarily available from a nonaffiliated transmission company. The final completion of the American Louisiana pipeline augments and replaces these two sources of natural gas supply.

The final answer for the space heating gas supply problem will be the American Louisiana pipeline and the terminal storage program. At the end of 1955, there were still 40,000 unsolicited space heating applications on file and more have been received daily. Michigan Consolidated will connect a large number of these this year and in future years.

The distribution company curtailed sales to interruptible consumers during 1955 and sold only a limited volume of such gas during 1954. Gas that would normally be marketed to customers in the interruptible classification was used in the development of the Six Lakes storage field and, in turn, to make possible the connection of the additional space heating customers.

To illustrate just what the construction of a major gas transmission line means to the operation and expansion of such a distribution company, take the example of Michigan Consolidated. Officials of this company estimate that more than $90 million will be spent to expand its system by the end of 1959—all as a direct result of the construction of the American Louisiana pipeline.

This expansion program started in 1952 in anticipation of an increased natural gas supply. From that date on, all design work for the Michigan Consolidated system had to take into account the added loads which could be connected when the American Louisiana pipeline was completed. Major projects, such as a 30-in. cross-town main in Detroit, which was installed at a cost of $2.25 million, were conceived and built under this criterion.

In 1953, the Six Lakes gas field was on its last leg toward final

Expansion of distribution systems has been the pattern throughout the area that will receive natural gas from the American Louisiana pipeline. Here Michigan Consolidated enlarges its system in Ypsilanti, Mich.

depletion as a gas producing field. Michigan Consolidated began conversion work to develop this field into an underground storage reservoir. This project will have a total cost of $21 million and is attributable to the additional natural gas delivered by American Louisiana.

Three other major main construction projects were completed in 1955 and the company has made other additions that were designed in relation to the future increased deliveries of gas from American Louisiana.

In the next three years Michigan Consolidated plans to extend services to a large number of communities across the state and begin development of additional terminal storage fields. They will also construct more major feeder mains in the Detroit distribution system and its outstate properties to distribute the increased supply of gas.

Backbone of the Michigan Consolidated physical system is two parallel 24-in. lines extending from the terminal point of the Michigan Wisconsin Pipe Line Co.'s major transmission system, near the Six Lakes storage field, to Detroit. The latter city is, of course, the major distribution point in the system; however, such cities as Ann Arbor, Mt. Pleasant, Greenville-Belding, Grand Rapids, Big Rapids, Muskegon, all contribute to the over-all sales of 112 billion cu ft in 1955.

The American Louisiana pipeline ties in with the twin Michigan Consolidated 24-inchers at a recently completed meter and receiving station near Willow Run. In effect, the Michigan Consolidated lines join the terminals of the Michigan Wisconsin and American Louisiana pipelines to bring adequate natural gas supply to Detroit and other distribution systems. In addition, a third pipeline—Panhandle Eastern, (nonaffiliated) ties in with Michigan Consolidated.

Gas supply

Of the peak sales year volume, 112 billion cu ft in 1955, about 60 per cent is supplied by the affiliated Michigan Wisconsin Pipeline Co. The remainder was purchased from Panhandle Eastern Pipe Line Co., which has FPC authorization to deliver 127 MMcf/day. Michigan Consolidated will continue to purchase approximately the same volumes from these two suppliers.

American Louisiana will supply additional gas to permit expansion of the capacity of the Michigan Consolidated system. The new pipeline is certificated for an initial total daily delivery 300 MMcf. While the Gulf-Coast-to-the-Great-Lakes pipeline was under construction, American Louisiana applied to FPC for additions to the system that will enable it to increase delivery to 400 MMcf/day.

By order dated Aug. 8, 1956 the FPC granted temporary authorization for American Louisiana to construct the first phase of this expansion program which calls for two new 12,000-hp compressor stations and the addition of 2000 hp to each of two other stations. This order authorized delivery of the entire 60 MMcf/day to Michigan Wisconsin Pipe Line Co. until Dec. 31, 1956 and, thereafter, 55 per cent of the initial increased volumes are to be delivered to Michigan Wisconsin and 45 per cent to Michigan Consolidated Gas Co.

By FPC Opinion No. 291, dated May 7, 1956, Michigan Consolidated was allocated 200 MMcf/day of the total American Louisiana initial delivery; however, this was a temporary allocation. Only 135 MMcf/day of the allocated volume was permitted as permanent.

The anticipated delivery of an additional 200 MMcf/day from the new American Louisiana pipeline meant that Michigan Consolidated had to install new facilities to handle the additional volume through all phases of the company's operations. A new receiving station was installed near Willow Run. From this station, natural gas will be delivered either directly into Six Lakes storage field or into Michigan Consolidated's distribution network. Outlet piping from the Willow Run receiving station are a 30-in. line extending 19.3 miles to the Detroit distribution system and another 30-incher that takes gas 24.6 miles to a tie-in point with the two 24-in. lines that deliver to storage.

On Michigan Consolidated's end of the Willow Run station, gas measured by American Louisiana is received in a 30-in. line feeding out from a 30-in. outlet manifold and into a 20-in. line that has swaged down from 24-in. outlet manifold. Both of these manifolds are just downstream from American Louisiana's six 12-in. orifice meter runs. The 30-in., known as the Milford line, can take gas to the Six Lakes storage project.

The 20-in. piping permits flow to a pressure reduction setting and into the 30-in. Van Born main that delivers to the Detroit distribution system. Upstream from the regulator bank, gas heaters are installed in a 12-in. bypass to permit heating a portion of the flowing gas to a temperature that will assure the temperature of the total flow is above that at which hydrate formation would be predicted for the existing conditions of expansion through the regulators.

Pressure regulation is accomplished by three 8-in. Fisher pilot-loaded regulators, mounted in parallel, in 12-in. regulator runs. A 16-in. bypass is installed around the regulator bank. The regulator installation's outlet header feeds the 30-in. Van Born main. The 16-in. regulator bank bypass is tapped with a 6-in. line that branches to feed, after proper pressure regulation, natural gas for station use.

Bryant packaged boilers provide circulating hot water for the gas heaters and station space heating. An Onan gas engine-driven, stand-by light plant provides power for lighting and other electrical needs in the event of a commercial power failure.

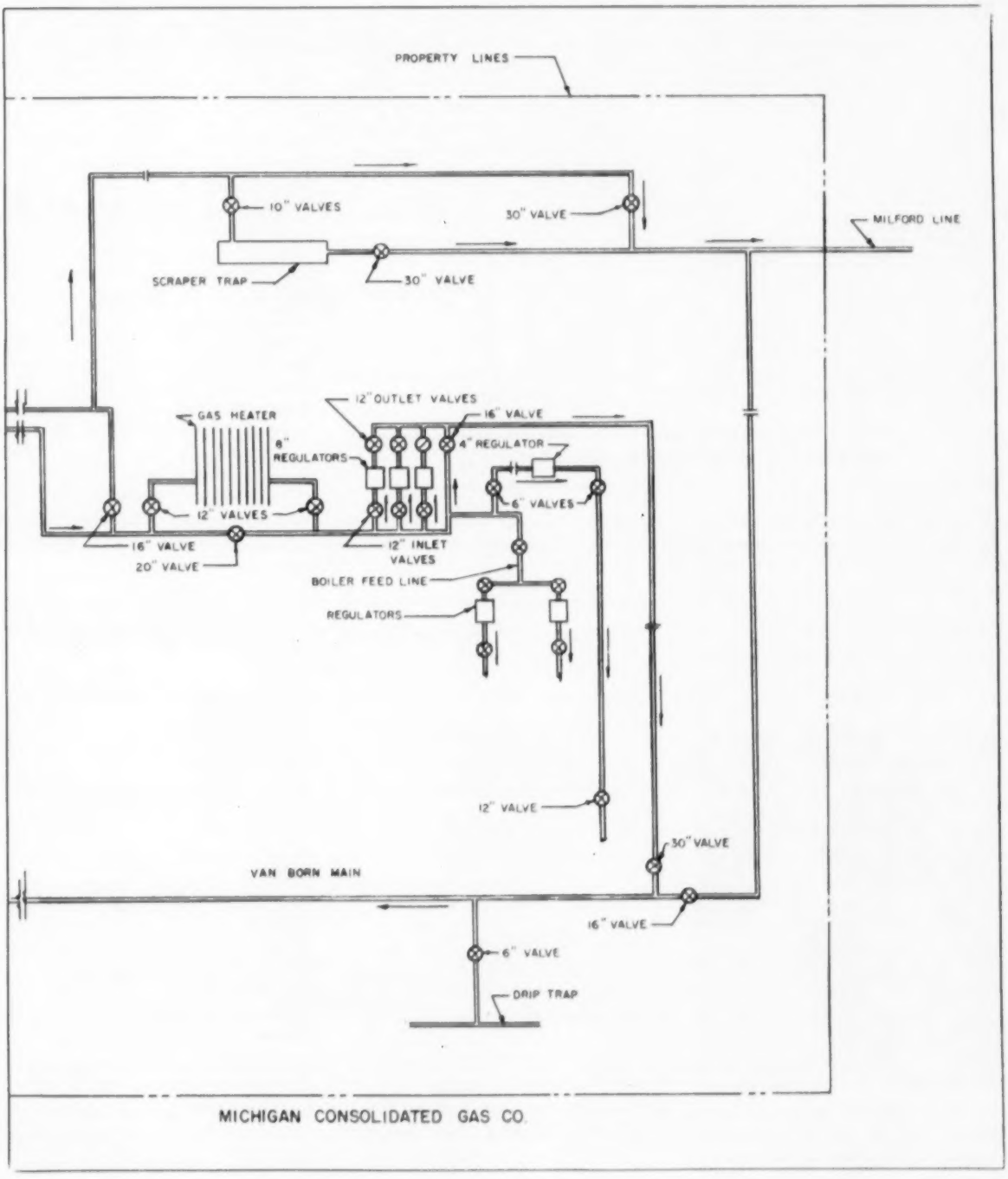
The station is equipped with rather complete instrumentation. Republic, Bristol, and Foxboro recorders provide data on pressure, temperature, and volume rate of flow for natural gas, water, and steam systems in and through the station. Strategic valves are fitted with Shafer operators for remote

control to permit desired gas routing.

Michigan Consolidated has put other projects under construction in anticipation of the additional natural gas that will be available from the new Gulf Coast to the Great Lakes pipeline. In 1955, for example, 39,230 new service lines were installed. This represents an increase of 5000 over 1954. Main extensions for 1955 totaled 302 miles; and increase of 50 miles over the previous year. Total distribution expenditures for 1955 were $19 million.

Plans call for the addition of several cities to the service area supplied by Michigan Consolidated. To make this expansion possible, and to improve service to existing towns served, 22 miles of 16-in. pipeline were installed from a connection point with Michigan Wis-

Flow diagram of Willow Run meter station.



consin's pipeline to Muskegon. Service to Muskegon has been markedly improved and work is progressing on the development of the important industrial areas along Lake Michigan between Muskegon and Ludington.

A number of towns and communities were provided with natural gas service for the first time in 1956. These include Ludington, Cadillac, and Traverse City. A number of others will be added this year and next.

MILWAUKEE GAS LIGHT CO.

MILWAUKEE Gas Light also has a dynamic expansion program underway. This expansion will project through 1960. Although not all of its plans are directly attributable to American Louisiana's development, the impact of the completion of this outstanding transmission project has meant Milwaukee's expansion program has been greatly accelerated.

During 1956, $8.5 million have been, and will be, spent in the construction of 150 miles of new distribution mains. Another 100 miles of new service lines are involved in this year's program and 3500 renewal services are involved. This will mean immediate improvement of gas service in Milwaukee's service area as it strives to deliver fuel to all who desire it in volumes to satisfy customer demands.

Still other construction budgets are projected. In 1957 about $9 million will be spent on the distribution system; this figure will be $8 million in 1958; $7.5 million during 1959; and another $7.5 million in 1960.

Natural gas is truly on the move in that section of the country served by Milwaukee Gas Light Co. American Louisiana's new pipeline has been a major stimulous for this distribution activity.

MICHIGAN WISCONSIN PIPE LINE CO.

THE expansion program planned by Michigan Wisconsin during the next few years is a direct result of the American Louisiana pipeline. Its projects designed to handle the new gas supply are many and varied. For instance, Michigan Wisconsin will construct 82.2 miles of 6.625-in. loop; 3.9 miles of 4.5-in. loop; 80.2 miles of 24-in. loop; 42.4 miles of 20-in. loop; 43.2 of 16-in. loop; and 3400 hp will be added to compressor power at an existing compressor station. Money budgeted for this expansion is $11.435 million. All of the looping, except part of the 24-in., is scheduled for completion during 1956. Fifty-six miles of the 24-in. is scheduled this year and the remaining segment will be scheduled for 1957.

The addition of power at the compressor station is being handled by Ford, Bacon and Davis Construction Corp. Contractors for the 16-in., 20-in., and 24-in. lines are H. C. Price Co., and Houston Contracting Co. Part of the smaller diameter line is being built by Gabe's Construction Co. (Sheboygan, Wis.).

Expansion caused by the advent of American Louisiana gas is not limited to affiliates of the American Natural Gas system. Michigan Wisconsin's other utility customers are to receive increased volumes of gas in the same proportions as will Michigan Consolidated and Milwaukee Gas Light. They in turn will have expansion programs in the same relative proportion. These utilities served by Michigan Wisconsin are shown in *Table 1*.

In January 1956, Michigan Wisconsin Pipe Line Co., under FPC Docket G-9850, filed an application to extend service from the Michigan Wisconsin pipeline near Appleton, Wis., to the Wisconsin River Valley and on to Eau Claire, Chippewa Falls and Menomonie, on the Chippewa river, and to LaCrosse on the Mississippi river. The latter two areas are in western Wisconsin. In addition, this application requested certificate to extend the Michigan Wisconsin line from Green Bay to Menominee, Mich. and Marinette, Wis. The total estimated cost of these expansion plans is $17.6 million. Construction would involve 723.9 miles of 4.5- to 24-in. pipeline and the addition of 16,000 hp to compressor stations. This construction will start upon receipt of FPC approval.

TABLE 1. UTILITIES SERVED BY MICHIGAN-WISCONSIN PIPE LINE CO.

Company	Cities served
Michigan Gas & Electric Co.	Niles, Holland (Mich.)
Wisconsin Natural Gas Co.	Racine (Wis.)
Michigan Gas Utilities Co.	Benton Harbor, South Haven, Otsego, Grand Haven (Mich.)
Madison Gas & Electric Co.	Madison (Wis.)
Wisconsin Power & Light Co.	Beloit, Janesville, Fond du Lac (Wis.)
Wisconsin Public Service Corp.	Green Bay, Oshkosh, Sheboygan, Two Rivers (Wis.)
Wisconsin-Michigan Power Co.	Appleton (Wis.)
Wisconsin Fuel & Light Co.	Manitowoc (Wis.)
Stoughton Light & Fuel Co.	Stoughton (Wis.)
Iowa Southern Utilities Co.	Burlington, Mt. Plasant, Centerville (Iowa)
Keokuk Gas Service Co.	Keokuk (Iowa)
North Central Public Co.	Ft. Madison (Iowa)
Iowa Electric Light & Power Co.	Fairfield (Iowa)
St. Joseph Light & Power Co.	Maryville (Mo.)

The formulators and fabricators of the American Louisiana pipeline

MEN make natural gas pipelines. All types of men are involved. Some have general skills, others are specialists in one of the sciences or technologies. All are men of vision and success. Above all, they are experienced. They have worked on other pipelines or have filled a specific post during the construction of other pipelines. This experience means safety and dependability of the finished new product. To the customers, the experience of management and pipe liners on the American Louisiana project spells adequate gas supply with a minimum of interruption of completely safe service.

Management that conceived the American Louisiana pipeline and worked so diligently to drive it to completion knows better than anyone else the credit that is due to the vast number of men who worked on the project in the offices and in the field. They know that men make pipelines and that it takes good men to make a good pipeline. American Louisiana has a good, efficient pipeline in operation, so it is obvious the personnel, under the direction of an able management, met the test. The following key members of the management team will be the first to tell you that the success of their project is due directly to the fine spirit and efficient performance of their pipeliners.

RALPH T. McELVENNY, Chairman of the Board

From his origin in the Pacific Northwest, Mr. McElvenny bent his course east and gained experience in several avenues of commerce and public service before joining American Natural Gas Co. to work with the companies in that system.

A Stanford University trained lawyer by profession, he started his business career with the Guaranty Trust Co. of New York, in 1930, and did legal, accounting, and investment work in the Trust Department. In 1933, Mr. McElvenny became a conservator in the office of the controller of currency in Washington, D. C., and supervised the affairs of various banks which had been closed during the "bank holiday" until the banks could either be reopened and returned to their management or placed in receivership. He next served the government on the staff of the Securities and Exchange Commission for 11 years as an attorney and administrative officer in the offices of the general counsel, the registration division, and the public utilities division.

In 1945 Mr. McElvenny returned to private business and became associated with the United Light & Power system which owned electric and gas utility companies, principally in the Midwest. He specialized, as an officer and director, in financial and regulatory matters. In 1950 he moved his offices to Detroit to work with American Natural.

Ralph T. McElvenny

THE FORMULATORS AND FABRICATORS OF THE AMERICAN LOUISIANA PIPELINE

John Dern
General Counsel

Mr. Dern was born in Salt Lake City, Utah and received economics and law degrees from the University of Pennsylvania before being admitted to New York bar in 1927, and the Illinois bar in 1930. In 1949 and 1950 he served as president of the United Light & Railways Co., and Continental Gas & Electric Corp., to expedite the liquidation of these firms.

Mr. Dern is a partner in the law firm of Sidley, Austin, Burgess & Smith, and is general counsel and a director of American Natural Gas Co. and American Natural Gas Service Co., American Louisiana Pipe Line Co., Michigan Consolidated Gas Co., Michigan Wisconsin Pipe Line Co., Milwaukee Gas Light Co. and several other major business organizations. In addition, he is a trustee of the University of Pennsylvania.

Varnum B. Steinbaugh
Consulting Engineer

A native of Michigan, Mr. Steinbaugh received his engineering degree from University of Michigan in 1921 and served in several important offices in private business, in state departments, and in the Federal government—all in engineering and technical services capacities—where he designed and supervised the construction of well known private and public structures.

From 1941 to 1955 Mr. Steinbaugh was consulting engineer for Michigan Consoliated Gas Co., from 1945 to 1955 consulting engineer for Michigan Wisconsin Pipe Line Co., from 1951 to 1955 consulting engineer for American Louisiana Pipe Line Co., and is consulting engineer for American Natural Gas Service Co. He is currently in charge of gas supply for the American Natural Gas system.

Mr. Steinbaugh has maintained his own consulting engineering offices during his career and is president of Allied Engineers Inc. and associated companies.

Wilber H. Mack
Vice President,
Secretary and General Attorney

Mr. Mack has served on the Securities Exchange Commission, Washington, D. C., in various positions, his last being that of principal U. S. attorney. After military service, he returned to SEC as assistant director of corporate finance division and held that post from 1948 to 1952.

Mr. Mack became affiliated with American Natural Gas Co. in 1952. He currently is secretary, vice president, general attorney and director of American Louisiana Pipe Line Co. and Michigan Wisconsin Pipe Line Co.; general attorney and director of American Natural Gas Service Co.

Westfield, Mass. is Mr. Mack's hometown. He was educated at Dartmouth and George Washington University law school, and was admitted to District of Columbia bar in 1935.

Frank Thompson
Vice President

Frank W. Thompson's experience includes a number of years in the gas and oil fields of California following his graduation with a BS degree in mechanical engineering from the California Institute of Technology. For six years he held several supervisory position with Los Angeles Gas & Electric Corp., predecessor to Southern California Gas Co.

Mr. Thompson has had regulatory experience with the California Public Utilities Commission and was a consulting engineer to the Federal Power Commission during the commission's investiga-

tion of the natural gas industry, Docket G-580.

The American Natural Gas system obtained Mr. Thompson's services in early 1950. He participated in the negotiations for the gas purchase contracts and carried the responsibility of design and engineering on the American Louisiana project.

Robert D. McClintock
Vice President and Manager of Construction

Mr. McClintock began his construction and engineering experience with Colorado Interstate Gas Co. after graduation from Colorado College with a degree in geology and a minor in civil enginering. At Colorado Interstate, Mr. McClintock's duties involved pipeline survey, construction, meter station construction, and all other types of construction pertaining to the operation of that company's pipeline. He was Colorado Interstate's construction superintendent when he left that company in 1949 to become a division engineer on the Michigan Wisconsin pipeline construction project with Ford, Bacon & Davis Inc. of New York.

Mr. McClintock held the position of pipeline superintendent for Michigan Wisconsin Pipe Line Co. from October 1949 until April 1951. He was then appointed manager of Michigan Wisconsin operations.

In December 1953 Mr. McClintock was elected and appointed to his present position. He is a member of the National Society of Professional Engineers and the National Society of Corrosion Engineers.

Fred H. McIntire
Assistant to the President

Mr. McIntire is a Texan who came to American Louisiana from the Federal Bureau of Investigation. He holds bachelor and master degrees in physics from Texas College of Arts & Industries, and was a member of the faculty of the college from 1939 to 1941.

Mr. McIntire was appointed special agent for the FBI in 1941 and served with that agency until July 1955. During his FBI career he was special agent in Washington, D. C. and Oklahoma City. He served as assistant special agent in charge of the Oklahoma City, San Antonio, and Atlanta offices. He became special agent in charge of the San Antonio office and held that position in San Diego and Detroit, consequently. He was appointed inspector in charge of the inspection and planning section of the FBI at Washington, D. C. He began his employment in his current position with American Louisiana in August 1955.

Rex V. Campbell
General Superintendent

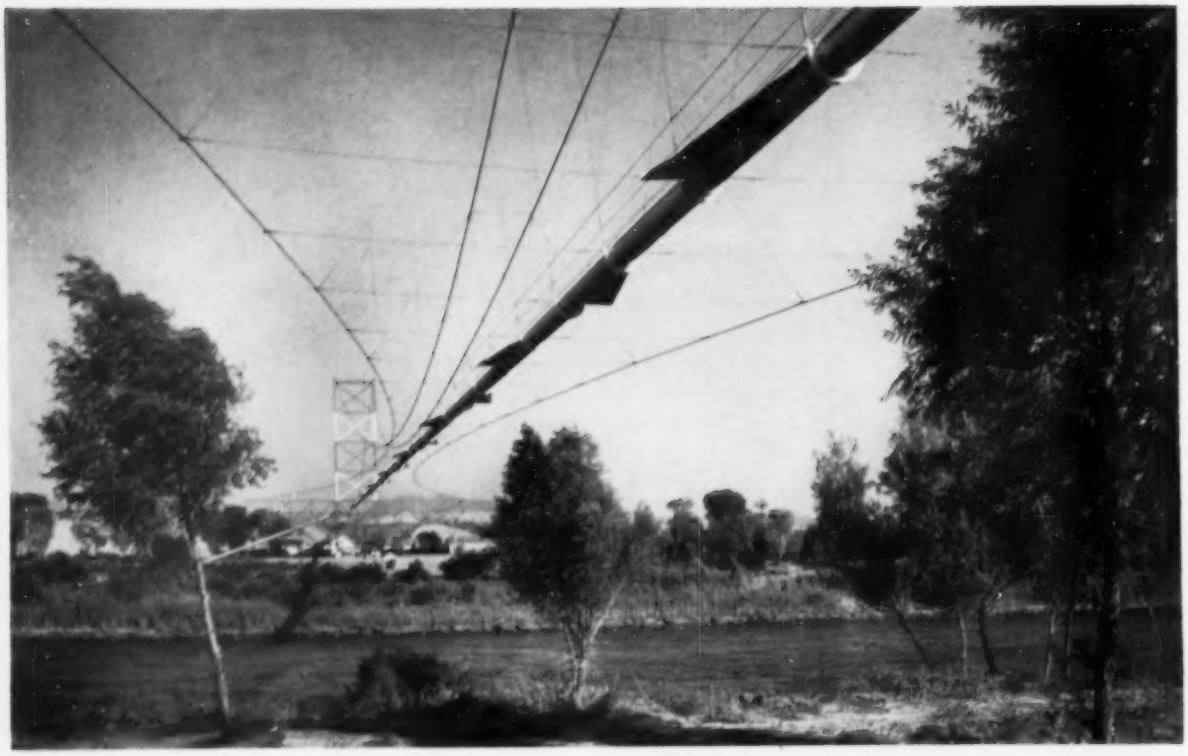
A pipeliner's pipeliner and engineer, Rex Campbell began his

long experience in pipelining shortly after earning his degree of BS in mechanical engineering from Oklahoma A & M. His first work was as a machinist at the Cambridge station of Cities Service Gas Co. From there, he worked as a machinist, oiler, repairman, auxiliary engineer, engineer in three other compressor facilities of the same company. Cities Service Gas made him a mechanical engineer in 1937.

Mr. Campbell subsequently held the positions of assistant superintendent of compressor stations, and construction superintendent on compressor stations and dehydration plants until September 1943 when he accepted the position of assistant superintendent of compressor stations with Panhandle Eastern Pipeline Co. in Kansas City. Panhandle Eastern's compressor department was increased in total horsepower from 36,000 to 150,000 during the time Mr. Campbell was with them.

In July 1949, Mr. Campbell joined Ford, Bacon & Davis Inc., New York, as assistant superintendent of compressor stations to construct and operate Michigan Wisconsin Pipe Line Co.'s construction project. In November 1949, he joined Michigan Wisconsin as superintendent of compressor stations.

Mr. Campbell was transferred to the American Louisiana Pipe Line Co. as general superintendent in 1955.



Natural gas comes to southern California through pipelines of El Paso Natural Gas Co. Here the line crosses the Colorado river near Blythe, Calif.

Management brings gas to the Pacific Coast

By PAUL KAYSER, President El Paso (Texas) Natural Gas Co.

THE problem of supply is the really critical problem facing the natural gas industry today. So it is highly important to discuss the subject of supply to California from the standpoint of management.

The Lord put the gas in the ground in hidden recesses scattered over the nation but it is up to management to get it to the consumer. Obviously, this is a cooperative job between the producer, the pipeliner and the distributor.

The bringing of out-of-state gas to California is a classical illustration of such cooperative effort.

In 1943 El Paso Natural had a little 8-in. pipeline to a copper mining and smelting operation at Ajo, Ariz., about 125 miles east of the California border.

In order to explore the possibilities of extending this line to California and sending a small amount of gas into the state, we talked to Frank S. Wade, then president of the Southern California Gas Co. He said they did not then need any additional gas but that he had under study the question of supply of California-produced gas versus the increasing California demands, and that we should keep in touch with him on this matter.

In the summer of 1945 we came to Los Angeles for a conference with the executives of the southern California companies on the specific questions of how much out-of-state gas they could use and what was their probable future demand. At that conference, it developed that management studies of the supply and demand situation in California indicated that the southern California companies definitely could absorb, in 1946 or 1947, an addi-

tional supply of 125 MMcf/day above that produced in the state, and shortly thereafter 175 million, and in the course of three years this would increase to 305 million.

Without waiting to make a contract, we returned to El Paso and immediately prepared an application to the Federal Power Commission for a certificate of public convenience and necessity to deliver these quantities of gas to the California market at a delivery point on the California-Arizona border near Blythe.

After filing this application on Aug. 10, 1945, we called K. S. Adams, at that time president of Phillips Petroleum Co., and told him of our plans and the fact that we had filed with the FPC an application for a certificate and that we wanted to buy additional quantities of gas from his company for the purpose of supplying the California demand.

Mr. Adams was as cooperative as a man could be and, with his associates and engineers, came to Houston and spent an entire week negotiating with us a contract for the gas necessary to sustain the pipeline. This contract had the very great virtue that it provided for the taking of residue gas that was then being flared to the air in the Permian basin, and backed up this source of supply by the dedication of dry gas reserves in the Texas Panhandle to be taken as the supply of residue should decrease.

After working out this contract, we made an arrangement with the executives of the southern California companies at Los Angeles for the first part of September 1945. Mr. Adams, again representing the producer, was most cooperative and, in fact, came by El Paso in his plane and picked up the executives of El Paso and we went to Los Angeles together for the conference with the executives of the distribution companies. After a full week of negotiation, we concluded a contract which consummated the transaction. This contract provided for the construction by El Paso Natural of a 24-in. pipeline from the Panhandle of Texas to Eunice, N. M., and a 26-in. pipeline from this point west to the Colorado river to a point near Blythe, Calif. Likewise, it required the construction by the California companies of a 30-in. line from such point to Los Angeles.

The rest is simply a matter of record. The pipelines were built; gas was delivered to California in October 1947 at the rate of about 150 MMcf/day. That delivery has grown every year until at this time we are delivering to the southern California companies at the California border more than 800 MMcf/day and are under contract to increase that delivery to 1.3 billion cu ft per day.

This could not have been accomplished except for genuine effective cooperation between the producer, the pipeliner and the distributor.

The first delivery of gas to northern California through Pacific Gas & Electric Co. followed the same pattern. The executives of PG&E came to El Paso in the spring of 1947 to discuss the possibilities of an additional gas supply for northern California. It was necessary to secure initially approximately 200 MMcf/day of gas before it would be economically feasible to deliver the gas to the bay area of San Francisco.

The result of that conference was that we immediately began negotiations with various producers to acquire at least 200 MMcf/day of gas backed by reserves for a 20-year period. There was no single block of such gas available and it required the making of many con-

Pipeliners lay pipe to bring gas to West Coast. Here a crew was photographed while working on the El Paso line which brought gas through Arizona to California.

tracts with a large number of producers before we were able to assemble the quantity necessary to make first deliveries to northern California. This was done and I can assure you that we received the necessary cooperation from the producers in both the west Texas-New Mexico area and the San Juan basin area.

Essentially that cooperation requires the producer to be willing to sell his gas at a fixed price under a long-term contract, rarely for less than 20 years, and to wait for the beginning of the market until the application for certificate can be filed with the FPC, hearings had and decision reached by the commission, before even construction of the pipeline can begin. The time between the signing of the contract with the producer and the first delivery of gas under the contract is frequently more than two years. In addition, the producer likewise must cooperate in making available all of the data necessary to estimate the reserve involved so that the matter can be covered in testimony to the commission and satisfactory reports can be prepared for the required financing.

These are matters that call for the exercise of forbearance, understanding, intelligence and judgment at every turn of the road. Without that kind of consideration and cooperation on the part of the producer, it is impossible to obtain the gas supplies necessary to satisfy the demand.

The contract with Pacific Gas & Electric Co. was signed in 1948 and the necessary pipeline was built from the San Juan basin with a connection to the 26-in. pipeline leading to Blythe. On Aug. 17, 1950, deliveries were first made to PG&E at a connection on the California-Arizona border near a little point called Topock. First deliveries were in the amount of approximately 150 MMcf/day, and they have steadily increased every year until we are making deliveries now in excess of 800 MMcf/day to PG&E at this point, and are under contract to deliver to such company up to 1.25 billion cu ft of gas per day and it is expected the full amount of such

Pacific Gas & Electric Co.'s Super Inch line starts here at Topock, Ariz. PG&E receives delivery of the gas from El Paso at mid-point of the arch bridge in left of picture.

A great amount of management planning has gone into the system of El Paso Natural, shown on map here.

deliveries will be made within the next two years.

These are not small transactions. I have conducted all of the negotiations with the executives of the California distributors and I have negotiated the principal contracts with the producers. I am willing to say that, in my judgment, no single job required of the executives of the southern California companies exceeds the job of studying the demands for gas in their area and appraising the evidence of trends in those demands and in arriving at some reasonable estimate of the future demands they will be called upon to meet.

Such demands cannot be met on a hand-to-mouth basis. Planning must be two to three years in advance. It is too late to supply additional demands if you wait until the prospective consumer calls on the phone and wants the connection. You must anticipate that call by nearly three years.

Likewise, in relation to its gas operations, the Pacific Gas & Electric Co. has no greater and more complex problem than balancing the question of future demands against the gas they must contract for to supply those demands. Again, all of these things must be anticipated from the distributor's standpoint about three years in advance.

But the poor pipeliner has the hardest job of all. He is caught between the upper millstone of the constant demands of the distributor for vastly increased quantities and the nether millstone of the producer in his natural desire to realize the best price he can for his commodity in the face of an insistent, increasing demand. This is no easy spot in which to maneuver.

We have no greater problem before us today and since 1945 have never had before us any greater problem than the acquisition of reserves—by exploration for and development of proven reserves, purchase of proven reserves in place, and purchase of gas at the mouth of the well under long term contract—to supply the increasing demands of the consumers in California.

I do not have to tell you that this is not a one-man job.

From my experience in negotiating with the California distributors, I am sure that they each have an organization working on the exact problem of anticipating increased demands which reaches with its roots into every major department of the entire company.

Foresighted management was needed to provide gas service for the hundreds of subdivisions like this one that have sprung up in California in recent years.

So far as we are concerned, as the pipeliner, in order to meet these demands we have set up a geological and petroleum engineering department whose sole business is to keep books on all of the producing areas in which we operate. When I say keep books—*I mean keep books.* We endeavor to make a record of the reserves of every field in these areas and to keep track of every new discovery. We obtain logs on all wells drilled, both productive and dry, and assemble geological information from surface geology, aerial photo work, seismic work, gravity and magnetometer surveys and subsurface information from wells that have been drilled in the area. We try to keep this information down to date.

From it, our engineers and geologists prepare their testimony and exhibits for presentation to the FPC and assist the independent petroleum engineers and geologists in the preparation of reports required for financing. In the last five or six years we have relied upon our own geologists and engineers for the presentations to the commission. We use outside, independent geologists only for making the reports necessary in connection with financing.

From our own geological and engineering studies we make plans for exploration, the purchase of proven reserves, and the making of long term contracts for the purchase of gas at the mouth of the well.

We feel that we would be flying blind unless we had such an organization. Obviously, decisions on all of these things call for the exercise of greatest discretion and judgment on the part of management.

In addition, management has a particularly important and difficult role to perform in the organization of the various departments required to carry on these activities effectively. These questions involve the amount of manpower and quality of personnel that will be required and the location of such personnel. We find it necessary to maintain an office in Houston with a very substantial amount of such

Gas for the West—Pipeliner, distributor must not overlook the need for exploration

personnel because of the fact that Houston is practically the capital of the oil industry and the offices of others in the industry located in Dallas, Fort Worth, Tulsa and New Orleans are much more accessible from Houston than from El Paso.

Pipeline management has another difficult problem that faces it every day, and that problem is—where is the best place to look for gas? I can illustrate that this way. In 1934 we decided to enter the production side of the business and began acquiring leases for such purpose. We made a rule that we would acquire leases within 50 miles of any pipeline that we had. That looked like a smart, sensible step. It turned out to be a very shortsighted and foolish step. We should have aggressively acquired leases within at least 200 miles of our pipelines. I will admit that we could not have foreseen that we would now be acquiring leases in British Columbia, fairly close to the North Pole, and leases situated on the bottom of the Gulf of Mexico, offshore from Louisiana. The problem is a continuous one and requires the exercise of the most careful judgment on the part of management.

In addition, how much money shall we spend on a given wildcat project? It is almost like standing at a gambling table. If you risk too little, you will probably lose it all. If you risk too much, you go bankrupt.

You can't expect to find either gas or oil without planning a campaign and being willing to support that campaign by the expenditure of large sums of money. If you hesitate or vacillate, you certainly will lose your money. But our experience indicates that if you pursue it aggressively you will be able to obtain the result you are striving for, namely, the accumulation of substantial reserves.

I believe I can illustrate the matter by statistics so far as we are concerned. In 1950 El Paso Natural owned only 800 billion cu ft of gas reserves. At the end of April, this year, we estimated that the company's owned gas reserves were 5.7 trillion cu ft. We didn't discover all of this gas but we discovered some of it, and we acquired all of it by aggressively exploring for it and evaluating discoveries that others had made, and by making extensions of producing fields in the areas in which we were operating. But it required the expenditure of very substantial sums of money.

It would not be intelligent to discuss the role of management in connection with bringing gas to California if we did not give some consideration to the problems of the independent producer. From the standpoint of the distributor and the pipeliner, one of the most important things to understand is that the producer's management has before it the choice of two markets (1) the regulated interstate market and (2) the fast-growing free intrastate market.

The intrastate market is developing rapidly because of the flow of population to the west and southwest and the consequent very rapid industrialization of these areas. Ten years ago in the Permian basin the purchase of gas for intrastate use presented no effective competition against the purchase of gas for interstate use. Today new power plants have sprung up all over the area and all of the cities in the area have grown at fantastic rates, and the requirements for fuel for pumping underground water for irrigation purposes have increased in a most remarkable fashion.

All of these things have created an intrastate demand for gas in the west and southwest that has grown to very substantial proportions and, obviously, the managements of the producers are extremely anxious to take advantage of such free market. This is a necessary incident to a free economy. It is true that if the interstate market for any reason should be cut off there would be a terrific surplus of gas far beyond the needs of the local market but, nevertheless, under present conditions of both interstate and intrastate markets, the intrastate market is a factor in fixing the price of the gas.

The biggest problem before the producer, however, is the question of exploration and here is a point that the pipeliner and the distributor must never overlook.

Taking into account the vast sums of money the pipeliner and the distributor have invested for the purpose of supplying gas to the consumer, and the reliance of the consumer upon such supply, it is certainly unintelligent for the pipeliner or the distributor to take the position that no incentive to explore for gas is needed because the producer is going to explore for oil in all events.

The natural gas industry is too big and too important to rely for its life blood upon the by-products of any other industry. The only way it can avoid this position is to let the price in the field increase sufficiently under the laws of competition to give and maintain an incentive for people to explore for and produce gas for its own value. It should not be solely a by-product of exploration for oil.

The thing that management must never lose sight of is that the continuity of supply is wholly dependent upon aggressive, intelligent exploration to find the gas reserves necessary to support the service. If you do not keep an eye on that fact, you are certainly flying blind and sooner or later will run into disaster.

Speaking for pipeline management, I want to express our appreciation for the intelligent, cooperative spirit in which the management of both southern California companies and Pacific Gas & Electric Co. have approached the mutual problems which it has been necessary for us to solve. So long as that attitude is maintained, we may confidently expect that the increasing demands of the state of California will be met so far as it is possible to meet them within the limits of the economically procurable supply of gas, and I wish to pledge my management's support to that intelligent cooperation. ■

This article was adapted from a talk presented by Mr. Kayser at the Pacific Coast Gas Association convention Sept. 11-13, 1956, at Del Coronado, Calif.

AGA returns to Atlantic City for 38th annual convention

THE biggest gas industry gathering of the year—the annual American Gas Association convention—is slated for Atlantic City this month when more than 4000 delegates convene for their 38th get-together. Sessions of the three-day meeting, Oct. 15-17, are slated for the Auditorium and the Traymore and Haddon Hall hotels.

General sessions will be held at 10 each morning. At the opening general session, Dean H. Mitchell, president of Northern Indiana Public Service Co. and president of the AGA, will present members with a "state of the nation" report, recounting the progress our industry has made and expressing his views of some of the things that might be done by future administrations.

Coming patterns of regulation are to be outlined by Jerome K. Kuykendall, chairman of the FPC. Mr. Kuykendall is noted for his forthright comments on views and attitudes of the FPC.

Rising costs of materials, lack of

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MidSouth Gas

a sellers' market, savage competition—these are obstacles in the road for manufacturers and utilities. W. F. Rockwell, Jr., headman of both Rockwell Manufacturing Co. and GAMA, will offer a coordinated program of progress designed to benefit the entire gas industry.

Herman W. Steinkraus, president, Bridgeport Brass Co. and past president of the Chamber of Commerce of the U. S., is scheduled to speak on "America's Role in a Changing World."

A first-hand view of the current business outlook will be given delegates by Dr. Martin R. Gainsbrugh, chief economist, National Industrial Conference Board.

Sectional activities also have been planned with a view to bringing delegates up to date on problems and progress of their particular branch or branches of the industry.

At the Monday afternoon meeting of the accounting section, Emmet T. White, Public Service Electric & Gas, will report on the Harvard electronics research project. Carl D. Osterholm, Northern Natural, will discuss efficient utilization of tax departments, and Clyde O. Carpenter, Jr., Knoxville Utilities Board, will speak on policies affecting customer relations.

Also scheduled at an accounting section session is J. W. Carpenter, Long Island Lighting Co., speaking on figures, facts and folks. The credit picture in the gas industry will be discussed by a panel with F. T. Hager, Philadelphia Gas Works, as chairman. Panel members are R. B. Mitchell, Peoples Gas Light & Coke; F. J. Maguire, Boston Gas; H. S. Hahn, Ohio Fuel Gas; and W. C. Washburn, Equitable Gas.

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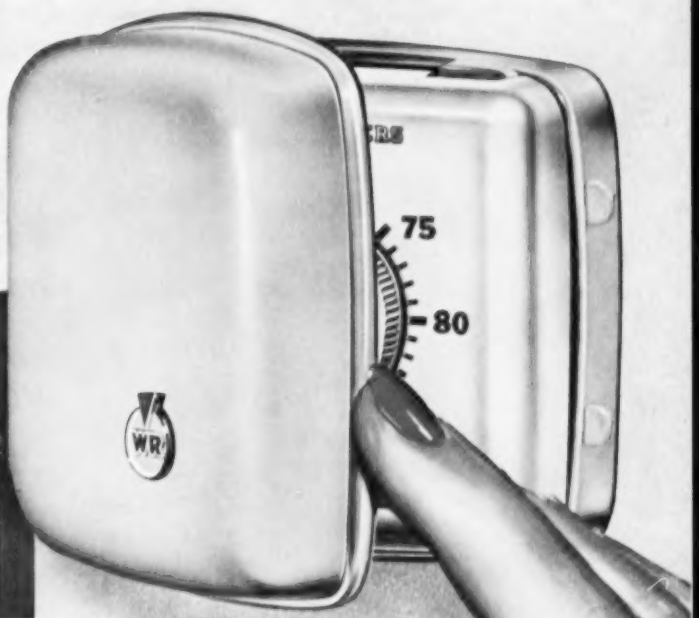

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gas section's meeting will begin with a luncheon in cooperation with the residential gas section. AGA's managing director, C. S. Stackpole, will present Mrs. America to the guests and the principal address will be given by A. W. Conover of Equitable Gas. Luncheon guests will be shown the new color motion picture, "Trying On Your New Home." This film, produced by the *Woman's Home Companion*, features all seven domestic uses of gas.

At the section's reconvened session, the first speaker will be Fred A. Kaiser, Michigan Consolidated, talking on sales. Joseph J. Famularo, Columbia Gas System Service Corp., will speak on developing manpower. Roy E. Wright, NEGEA Service Corp., will tell delegates about progress in industrial and commercial gas service.

The residential gas section will conduct its meeting after the joint luncheon. Cecil M. Dunn, president of Magic Chef, Inc., will invite delegates to consider the customer in an inspirational talk. John H. Wall, Servel Inc., will tell what's ahead now that Servel has gotten the green light.

An outstanding event of the residential gas meeting will be a dramatic and informative presentation, "Automatically Yours," featuring the new and revolutionary gas range automatic top burner heat control. Frank H. Trembly, Jr., director of sales, and Janet M. Lappin, home service director, Philadelphia Gas Works, will stage the presentation.

The traditional home service breakfast will be held at the Traymore on Tuesday morning with Mrs. Eleanor V. Wiese, Public Service Electric & Gas, presiding. Mrs. Charlotte Montgomery, columnist and consultant, will tell "What Mrs. Consumer Wants."

At the home service roundtable meeting, Betty Jayne Frahm, Montana-Dakota Utilities, will talk on "Operation Billings," and how it was conducted. Alice Strickler, Public Service Electric, will discuss home economics as a career; Margaret Davidson, household editor of the *Ladies' Home Journal*, will give an editor's viewpoint on how America lives today; and Marjorie T. Chandler, Consumers' Gas Co. of Toronto, and Sarah Sicker, South Jersey Gas Co., will describe successful programs conducted by their respective companies for business girls and housewives.

H. N. Oldham, Pioneer Natural Gas Co., will ask delegates to the operating section meeting to take a look at what the customer sees in its gas company. A long-range forecast of what's ahead for the gas industry by James Webb, Consolidated Edison Co., will wind up the session with a discussion on meter economy and standardization.

At the second meeting of the operating section, Larry Shomaker, Northern Natural, is scheduled to discuss gas control and operational planning. Color films on bringing wild gas wells under control will be featured with narration by M. M. Kinley, Houston, producer of the film.

The general management section has scheduled Raymond Stevens, president of Arthur D. Little, Inc., to discuss the increasing complexity of our industrial society and the need for adopting a research approach to management problems.

An outstanding feature of the convention will be the "Pattern for Progress" luncheon and meeting on Wednesday. This special luncheon will be devoted exclusively to an interesting, informative and dramatic presentation of the progress and development of gas year-round air conditioning.

On the social side of the picture, delegates and guests are invited to the president's reception at the Auditorium ball room on Monday night. Tuesday will feature a style show and luncheon for the ladies and on Tuesday evening the convention entertainment committee has lined up a program of top variety entertainment acts. ■

Grove Lawrence
SoCal Gas Co.
Operating

Victor Bittner
Peoples Gas Light
Operating

Herbert C. Jones
New England Electric
Operating

W. D. Sweetman
Peoples Gas
Accounting

D. W. Peterson
Minneapolis Gas
Accounting

J. R. Delaney
Cincinnati Gas
Industrial, Commercial

Roy E. Wright
NEGEA Service
Industrial, Commercial

Leslie A. Brandt
Peoples Gas Light
General management

John Wimberly
Houston Natural
General management

W. D. Williams
N. J. Natural
Residential gas

A. G. Bur
Wisconsin PS Co.
Residential gas

Industry and government leaders gathered at Sauvies Island in the Columbia river near Portland, Ore. to celebrate the arrival of natural gas. Shown here are (left to right): Douglas McKay, former secretary of interior and former governor of Oregon; C H. Gueffroy, president of Portland Gas & Coke Co.; Harold Massey, managing director of GAMA; Ray Fish, chairman of the board, Pacific Northwest Pipe Line Corp.; C. S. Stackpole, managing director of AGA; Clio Maletis, Mrs. America; Howard Pyle, deputy assistant to President Eisenhower, and Gov. Elmo Smith of Oregon.

"Scenic Inch" delivers gas to nation's industrial frontier

By J. FRED EBDON, Editor

IN this same issue last year, we told the story of an idea that grew into plans. Of plans that grew into work; and of work that grew into steel. These elements make up the Pacific Northwest Pipeline Corp.'s *Scenic Inch* pipeline. The pipeline is now a reality.

We know of no "record keeper" in the construction game. But, surely the construction of the *Scenic Inch* pipeline would be high, if not at the head, on the list of big projects completed in record time. Fish Northwest Constructors Inc. started the physical side of the big job on July 8, 1955. When you received your copy of *Gas* for October of last year with the construction of the pipeline as the main feature, there were about 166 miles of 24- and 26-in. mainline completed, and 51 miles of 16-in. lateral to a gas field was in place. Today, just one year—12 months, including lots of snow, rain, heat, and wind—later, the 2571-mile system is virtually built. Portland Gas & Coke Co. is in the midst of its conversion work to utilize the available natural gas in the distribution system at Portland.

Ray Fish and his associates in the Fish Engineering Corp. had the idea. Dick Ricketts and 1600 pipeliners in Fish Northwest Constructors carried the idea into reality magnificently when given the certificate, material, and financial requirements. Fish Northwest had the complete supervision and responsibility of building the project.

The vitality of the Pacific Northwest states is matched by the beauty of the area. Both factors were obvious during mid-August when a completion ceremony was held on Sauvies Island, in the Columbia river adjacent to Portland, Ore., to mark the physical joining of the *Scenic Inch* with the Portland distribution system. Though not the actual completion of the pipeline (is such a pipeline project ever complete?), this first tie-in with a distribution system representing a major market in the Pacific Northwest certainly was symbolic. The completion ceremony at Portland, then, meant that the main construction "battle" was won.

When a 90° elbow was flanged into the town border station at Portland, Howard Pyle, deputy assistant to President Eisenhower and former governor of Arizona, said: "The same spirit that motivated the Lewis and Clark expedition motivated these industrial pioneers, they had incentive. This pipeline started as a dream but ended as a typically American success story, built on free enterprise.

The world's largest magnesium foundry uses natural gas to operate its furnaces, melting pots and ovens. This plant produces intricate, lightweight parts for the aircraft industry.

Molten magnesium is poured into molds at magnesium plant of Howard Foundry Co., Chicago.

Gas plays important role in huge magnesium foundry

GAS utilization report

NATURAL gas is playing an important role in the daily production at the world's largest magnesium jobbing foundry.

The Howard Foundry Co., Chicago, uses gas exclusively as fuel to operate its tilting furnaces, holding pots, horizontal oven and batch-type core ovens. The company is one of Peoples Gas Light & Coke Co.'s largest industrial gas customers.

Howard Foundry is one of the prime suppliers of magnesium aircraft castings. These castings produced in the foundry are intricate and specifications are exacting. Gas plays a very important part in the manufacture of these magnesium castings and is the only fuel used in the foundry for melting and baking the cores.

Howard Foundry Co. entered the magnesium field during World War II. Unlike many other magnesium companies, Howard remained in the business during the postwar years. In 1948, when the demand for the product was at its lowest ebb, Howard purchased the huge Chicago plant from the government.

This foresight paid off for the company. Soon the U. S. aircraft industry became embroiled in a design race with other nations, and the demand for lightweight magnesium parts flourished.

As the lightest structural metal in the world, magnesium helped solve the big weight problem for planes operating beyond the sonic barrier. It is of little benefit to increase power unless weight can

Two pots of molten magnesium are poured into molds for making magnesium castings. Metal is poured between temperatures of 1375 and 1475° F.

A 50-ft horizontal continuous type gas-fired oven (above) is used to bake small cores at the Howard plant. Below, molten magnesium is poured into steel crucible after it has been melted at temperature of 1350° F in gas-fired premelt tilting furnace.

A rack of cores is shown below being moved into one of the 20 large gas-fired batch-type core ovens. Baking temperatures are kept as low as 300° F in ovens at the huge Howard Foundry Co. magnesium plant in Chicago.

be kept down. Magnesium and other light weight alloys provided the solution.

At Howard the metal melting is handled by a battery of 12 2000-lb gas-fired mechanical tilting furnaces with a total melting capacity of more than 36 tons a day. Alloyed magnesium is transferred to 72 gas-fired holding pots. Forty-eight of these pots have a capacity of 500 lb, the others 300 lb.

Magnesium is basically a highly castable metal, but this high castability can be achieved only if close control is maintained over the melting operation. This consists of first melting the alloy to a temperature of 1350° F in a gas-fired premelt tilting furnace. Samples are taken while the metal is still in a molten state and an analysis is obtained by use of a spectrographic quantometer. Any necessary additions of metal are made at this time.

The metal is then poured off to a steel crucible which is transferred to a smaller superheat furnace. The molten metal is next processed by bubbling chlorine through it for approximately 10 minutes in order to remove absorbed gas and clean the metal. Temperature of the metal is then raised to approximately 1650° F in the gas-fired superheat crucible furnace which requires about 15 minutes on the average. Superheating the metal effects grain refinement.

Following the superheat phase, the crucible is removed from the furnace and cooled to the desired pouring temperature—usually between 1375 and 1475° F. It is poured from the same steel crucible or holding pot in which the superheating takes place. Temperatures are closely checked by thermocouple immersion, and the pot must be removed from the furnace long enough before pouring to allow time for flux removal.

All core baking at the plant is done with gas. A 50-ft horizontal continuous oven is used for baking the small miscellaneous cores while 20 batch-type core ovens are employed for the larger ones. Baking temperatures are kept as low as 300° F.

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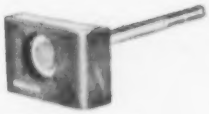

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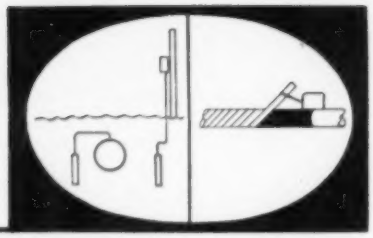


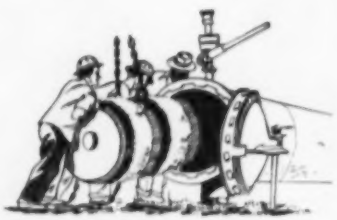
By GUY CORFIELD

Accelerated corrosion test

One of the fond dreams of a corrosion engineer is a reliable test method that will tell him, in a few days or weeks, what the corrosion resistance of a structure or assembly will be in a given environment over a period of years. Many such tests have been devised, such as salt-spray, weatherometer, soil box, etc., and are used with various degrees of success and assurance. One which is asserted to give "precision" results was developed about 5 years ago by the metallurgical engineering department of General Motors Research Laboatories. It is a cyclic humidity accelerated corrosion test for sheet metal, primarily intended for evaluation of inaccessible or "sheltered" parts of automobile bodies; but it would seem to be generally applicable to steel or alloys in a damp and chemically corrosive environment under conditions where a protective coating cannot be applied, or will wear or be scraped off, and any film of rust will itself be removed or otherwise not be protective.

Metal test coupons are used, 1½-in. wide by 3-in. long and about 0.035-in. thick. They are cleaned electrolytically in trisodium phosphate solution at about 170°F. Holes are drilled in each end, through which glass rods are inserted to provide support in the test cabinet which consists essentially of an insulated box which can be maintained at an inside temperature of 125°F. Auxiliary equipment includes facilities for passing air through the box at controlled humidities, and periodically covering and washing the coupons (in place) with a water-chemical solution by means of a leveling bottle that can be raised or lowered with flexible tubing. The test cycle, of 24 hr duration, is as follows: the coupons are covered with the water solution (1 per cent sodium chloride, 1 per cent calcium chloride and 0.1 per cent sulfuric acid, by weight), which is withdrawn and returned 3 times to produce a washing action, for a total time of 25 minutes; the solution is than drained out and air passed over the coupons, at relative humidities varying from 20 to 100 per cent relative in 3 cycles during the remainder of the 24 hours. On the 20th day the test is concluded and the coupons removed, examined for distribution and nature of rust and scale, cleaned cathodically in a 5 per cent solution of inhibited sulfuric acid, and weighed to determine metal loss.

It is stated that this 20 day test develops about 3 times as much corrosion as results in a 5 per cent salt spray cabinet in the same period, and produced about the same metal deterioration as occurs on susceptible parts of automobiles in the Detroit area in 3 years, and that the results are reproducible and have a high degree of precision. It is indicated that the most effective alloying elements, to increase the corrosion resistance of steel, are carbon, copper, manganese, and phosphorous. A description of this test method is given in detail in ASTM Bulletin of January 1953.



High-silicon cast iron anodes

The use of high-silicon cast iron for cathodic protection groundbed anodes has attracted considerable attention (see *GAS*, March 1956, page 141). This alloy, sold commercially as Duriron, has the approximate composition of iron 70.6 per cent, silicon 14.4 per cent, carbon 0.85 per cent and manganese 0.65 per cent. In 1952 the National Association of Corrosion Engineers' Technical Committee T-2B on Anodes for Impressed Currents initiated a test program to evaluate this material for this purpose, and data presented in their report in the July 1956 issue of *Corrosion* indicate encouraging performance.

It is stated that all laboratory and field tests indicate that coke breeze (as backfill) has no bad effect on silicon cast iron. In well tamped coke breeze consumption rates are sufficiently low to indicate 20 years service or more; two years service results in fresh water correlate well with laboratory findings which indicate that high-silicon irons corrode at a rate of only 0.25 lb. per ampere year in the range up to 3 amperes per sq ft, apparently independent of the pH of the water; tests in sea water indicate that if a relatively large anode is used at a density of less than 3 amperes per sq ft, 10 year life seems definite, and also indicate that molybdenum (3 per cent in the commercial alloy Durichlor) gives resistance to attack by evolved chlorine.

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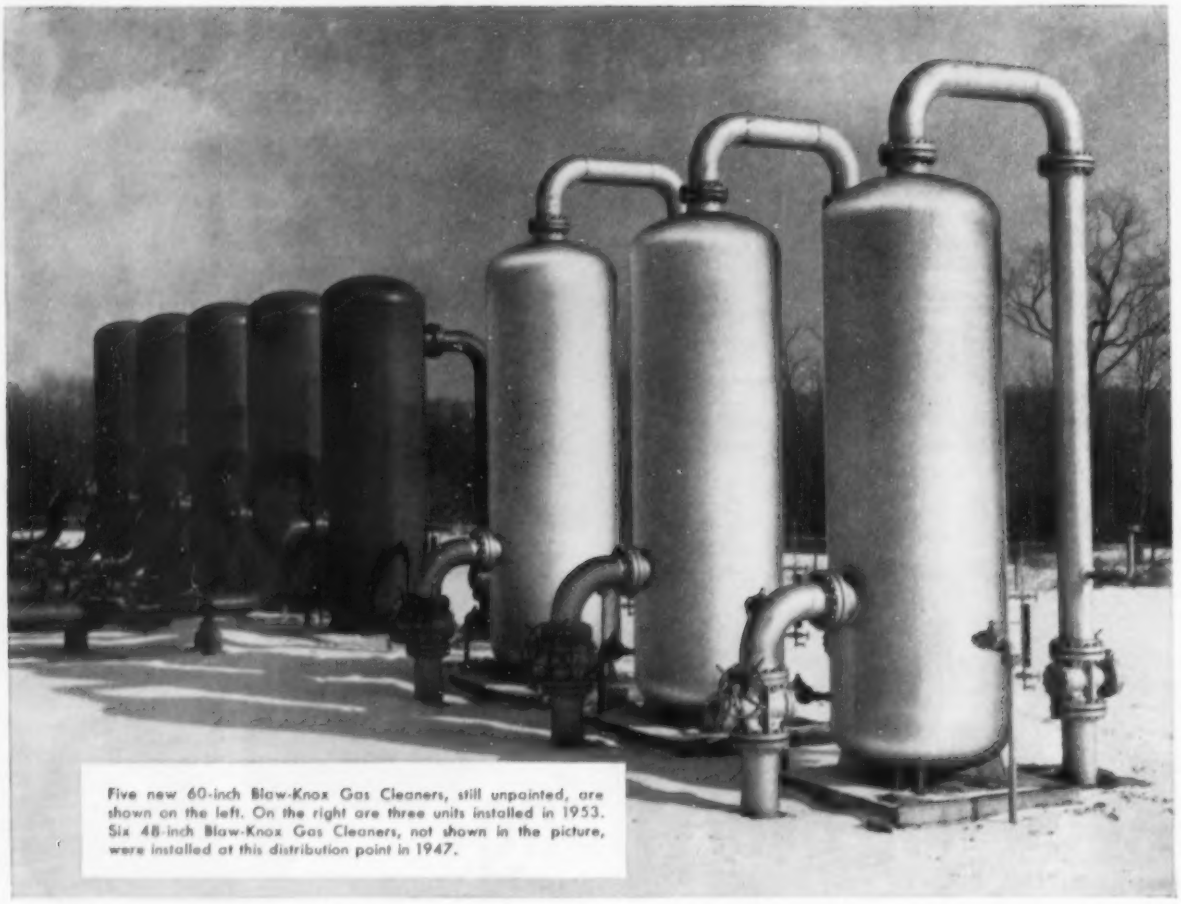

Five new 60-inch Blaw-Knox Gas Cleaners, still unpainted, are shown on the left. On the right are three units installed in 1953. Six 48-inch Blaw-Knox Gas Cleaners, not shown in the picture, were installed at this distribution point in 1947.

5 more Blaw-Knox Gas Cleaners for East Ohio's expanding system

To meet an ever-increasing demand for gas in the Cleveland area, The East Ohio Gas Company tapped the Panhandle Pipe Line Company's trunkline at Maumee, Ohio, with a new 30-inch, 600 psi gas line . . . ran it 112 miles to its Brush Station distribution point.

Five 60-inch Blaw-Knox Gas Cleaners were installed on the new line to remove all dust from the gas before it enters The East Ohio System at the Brush Station distribution points.

This thorough cleaning of the gas serves a dual purpose. It protects pipeline equipment against erosion by dust and insures satisfied customers by removal of dust that might clog service lines and pilots of appliances.

The 60-inch type is only one of a line of Blaw-Knox Gas Cleaners. So, if you have a gas cleaning problem, tell us the maximum hourly load, the minimum pressure at peak load, and the maximum pressure for which the cleaner should be designed. We will be pleased to submit our recommendations of the type to meet your requirements.

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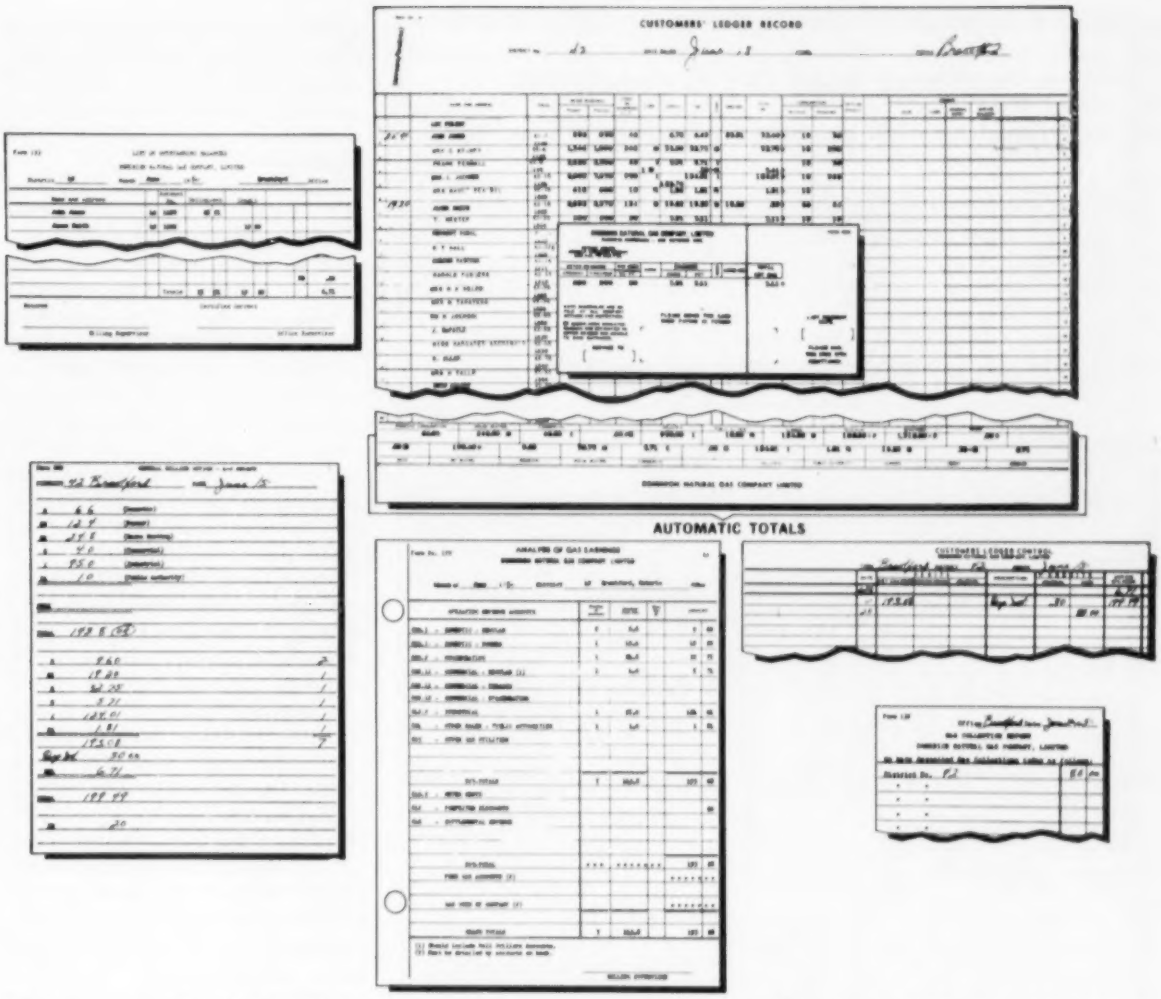

Forms across top (from left to right) are outstanding balances and bill, stub, and record forms. At bottom is recap sheet (left) and analysis report (bottom center). Forms at right serve as billing department controls for payments.

Push-button billing system speeds accounting work for Dominion Gas

FAST, accurate, economical yet simple methods for preparing customer bills and related records have been developed and proven by the Dominion Natural Gas Co., Ltd. Donald P. Spencer, Dominion treasurer, reports that the methods necessitated an investment of about $20,000 for billing machines, adding machines and additional addressograph equipment including an automatic bill feeder. The savings effected through this investment have

Key roles in system are played by three billers and 19-total accounting machines.

amounted to approximately $12,000 yearly, and there is sufficient capacity on the equipment to absorb about 10,000 more accounts without further investment.

An advantageous operational feature pointed out by Herbert G. Parker, supervisor of the billing department, is that the methods include automatic "push-button" distribution. At the completion of preparing customer's bills for a district, the touch of a button automatically prints totals in cubic feet and in dollar value for each customer classification and the net value of all billing.

"This eliminated the rehandling of meter books, bills and figures," Mr. Parker said, "and it still provides us with a breakdown or analysis that gives us an exact picture of consumption and revenue."

Dominion Natural Gas serves the southwestern part of Ontario that begins on the north shore of Lake Erie and extends northward for 50 miles and east-west for 200 miles. Billing some 55,000 gas customers in this vast area posed problems which management was determined to simplify and streamline.

Under former methods each of the company's 15 district offices was responsible for computing, writing and mailing its own bills, and for sending billing and collection reports into the executive offices at Buffalo, N. Y. As long as three years ago management felt that the overall system was too slow and too costly, and that district personnel should be relieved of as much billing work as possible, so that this time could be devoted more profitably to other district operations.

Under the direction of Mr. Spencer, the problem was solved by establishing a central billing office in Brantford, Ont., and by developing mechanized methods. A supervisor, an assistant, three billers, an addressograph operator and a multilith operator now print, address, and prepare all billing records, including an analysis report for management. Posting of collections is done in the branch offices. The multilith operator also prints, stocks and distributes all non-billing forms used by the company.

"Through the proper programming of the billing districts," Mr. Spencer said "we also were able to obtain automatically better 'lost and unaccounted-for' gas figures. Operating in so much rural territory as we do, we were able to make separate districts out of the smaller towns and villages where the number of meters did not exceed 900. In such places we have town border meters, which we read on the same day each month that we read the customers' meters. The difference between the reading on the town border meter and the sum of the customers' meter readings gives us our lost and unaccounted for figure for that time. On several occasions this has more quickly shown up a leak in the system that might not otherwise have been found for some time."

The billing methods were tested on a limited number of accounts

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in mid-1954. Results were so favorable that the remaining accounts were absorbed as rapidly as possible. This is how the system works:

Bills and billing records are first multilithed and pre-addressed.

On fixed dates each district sends in its meter books and a list of customers' names with outstanding balances, either delinquent or credit amounts. On billing dates that are fixed for each district, the billers first note outstanding balances opposite customers' names on the customer ledger record. Delinquencies are noted in black; credits in red.

The billers are then ready to write the bills and customers' ledger record in one operation on a 19-total Burroughs Sensimatic billing machine. Three of these machines are used for the 55,000 Dominion accounts.

After inserting the ledger and bill into the Sensimatic, the biller indexes the present and previous meter readings. The Sensimatic automatically makes the subtraction of these two readings and prints the consumption on the bill and ledger. Using a rate chart that stands at the back of the machine the biller then picks up the gross and net charges. Arrears are then indexed in the machine. These figures, together with the total net, are printed on the bill, stub and ledger. The biller then prints the minimum and reminder consumption on the ledger and is ready to prepare the next bill.

During the operation, if the bill is for domestic consumption, the cubic feet and dollar value accumulate separately in the billing machine. If the bill is for a different classification, such as industrial, house heating or public authority, the biller touches a "register selection" key on the Sensimatic. The cubic feet and value of the bill then accumulate in the machine for its appropriate classification. Small letters such as HH for house heating, I for industrial, SU for summer identify these charges.

Upon completing the bills for a district, the biller "clears" the

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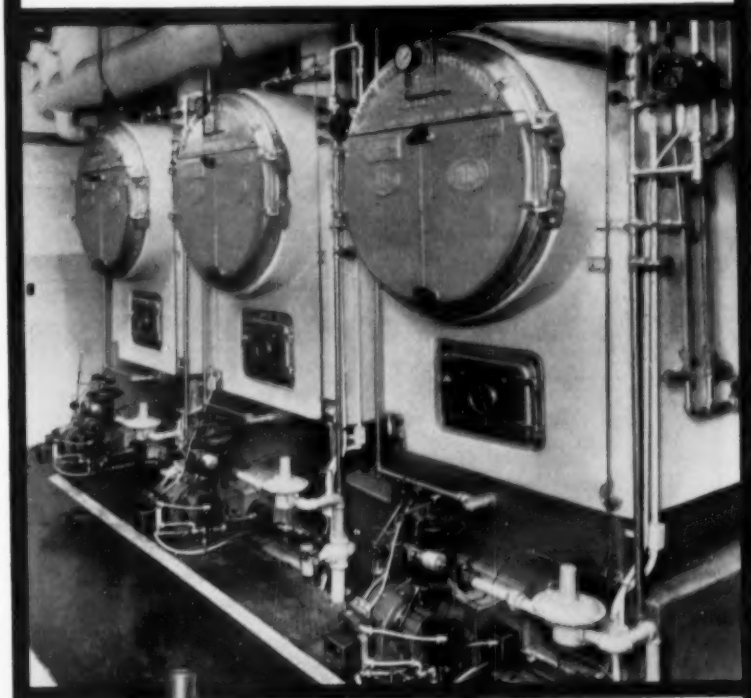

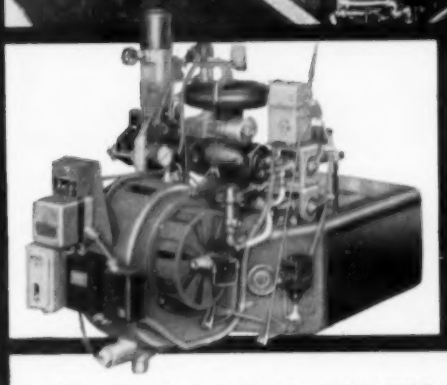

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machine. This causes cubic feet and dollar value totals for the district to be printed onto the ledger according to customer classification, net billing, minimum and remainder consumption.

Each biller turns out around two bills per minute or 120 per hour. About a month after the system was placed in effect, one of the billers decided to see the maximum production that could be attained. In one day she prepared the bills and ledgers for two districts, producing nearly 1800 bills.

Completed bills and ledgers are sent to the billing supervisor and his assistant for checking and balancing. This involves recapping the cubic feet and dollar value and verifying the customer count. Mr. Parker reports that his assistant does all of the balancing work and has time for other duties.

On a fixed date the bills, ledgers and meter books are returned to the appropriate district office for local distribution and collections.

Pointing out the importance of fixed dates and working schedules, Mr. Parker said, "When the system was first placed in operation, work was distributed to the billing operators as it was received. However, by later setting up schedules to assign work well in advance, overall billing time was reduced by about 40 hours per month."

This is attributed to the simple fact that personnel now know exactly what to expect and how to handle it, also, billers are permanently assigned specific districts, and they soon become familiar with them.

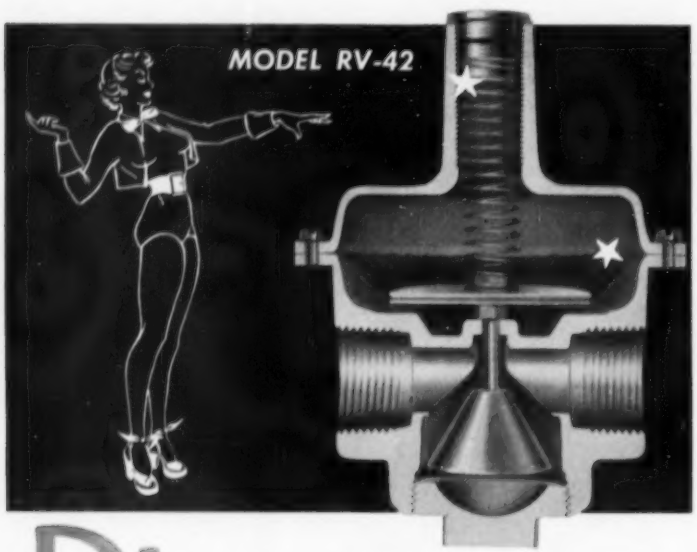
Meanwhile, from the balancing recap sheet, an analysis of gas earnings is typed up and submitted to the executive office.

"In effect," Mr. Parker said, "this is our report to management showing the number of accounts, consumption and dollar value for each customer classification in each district, with totals for all classifications."

Collections received in district offices are reported to the billing department and posted to a customer's ledger control that presents a daily total of collections and unpaid billing balances. The totals are transferred to a summary report that shows the daily amount of gas collections deposited, and the amount to be credited to the district's outstanding balance.

"The system is so logical and simple," Mr. Parker concluded, "that new personnel rapidly understand it and soon become proficient at their duties. Equally important are the facts that the methods are virtually error-proof, that management now has appropriate control over and current information on billing activities, and district personnel find it more convenient, particularly supervision which now can devote more time to their other responsibilities.

"These were the objectives Mr. Spencer set up when the system was being developed, and we feel that we have attained these aims." ■



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GAS news

Northern Illinois' Storage plan okayed

Northern Illinois Gas Co.'s plan to construct an underground propane storage cavern on Elmhurst Road in Elk Grove township about two miles northwest of O'Hare International Airport has been approved by the Illinois Commerce Commission.

Contracts will be let soon for the construction of the cavern, which will be mined out of rock about 280 ft below the surface. Northern Illinois hopes to get underway early this fall on the first phase of the project, sinking a 42-in. shaft into the ground. Mining the rock for the cavern is planned for this winter with completion of the operation sometime next year.

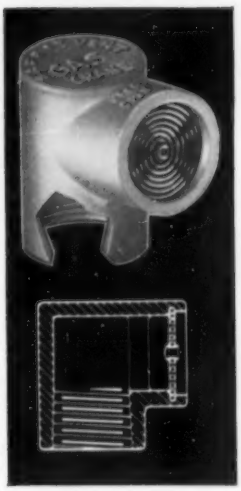
The cavern is expected to hold approximately 8 million gal. of liquid propane which will be used to augment the utility's natural gas supply.

Two companies plan merger with Brooklyn

Directors of Brooklyn (N.Y.) Union Gas Co., Kings County Lighting Co. and New York & Richmond Gas Co. approved the formal agreement for the consolidation of Kings County and Richmond into Brooklyn Union.

The consolidation plans are subject to the approval of the companies' stockholders as well as the New York Public Service Commission. Brooklyn's president, John E. Heyke, said the agreements provide for immediate steps to be taken for the necessary approvals.

When the consolidation is effected, some 165,000 customers will be added to Brooklyn Union's lines, 120,000 now being served by Kings County in the Bay Ridge area of Brooklyn and 45,000 on Staten Island now served by Richmond.



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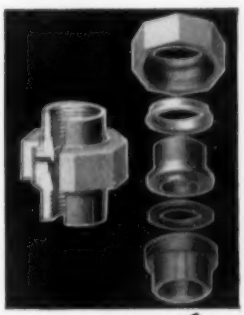

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The utility will then have more than 1 million customers on its lines.

Mr. Heyke said that the move will permit his company to integrate the operations of the three companies and provide opportunities for greater future growth, particularly on Staten Island. Employees of Kings County and Richmond will be absorbed by BU.

In connection with the consolidation, the outstanding shares of Kings County common stock will be changed into 210,000 shares of Brooklyn Union common on the basis of 21 shares of BU for each 44 shares of Kings County common stock. The outstanding shares of Richmond common will be changed into 90,000 shares of BU common on the basis of six shares of Brooklyn Union for each share of Richmond common. It is contemplated that the preferred stock of both the Kings County and Richmond companies will be called for redemption prior to the effectiveness of the consolidation.

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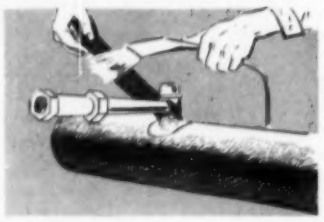

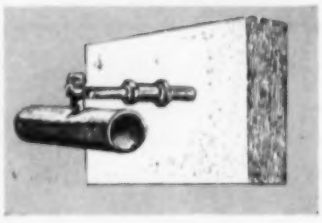

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Home Ec students work at SoCounties Gas

Home economics, which used to attract young women bent on husband-snaring, is now a full-grown partner to American business and industry. As such, the field is constantly in need of qualified home economists with a clear picture of business and industrial applications of their home-making art.

That's what 11 young women, sophomore home economics students from seven different California colleges, have been learning this summer. They have been taking part in Southern Counties Gas Co.'s summer on-the-job training program for home economics students.

The student-employees were hired by Southern Counties for six weeks to learn all phases of the gas company's home service program. They were assigned to seven of the utility's eight operating divisions and to its general office staff.

Dividing their time between their respective division headquarters and the Los Angeles office, the young future home economists were given thorough training in all phases of the gas industry and the use of gas appliances, and took part in appliance

A workman of the Pennsylvania Gas Co., Warren, sinks a new 6⅝-in. wrought iron casing in one of the firm's underground natural gas storage areas near Ludlow. Part of a maintenance program, the project is being carried out in the Ludlow-Kane area and includes reconditioning of all storage wells in that district. A total of 123 tons of corrosion-resistant wrought iron casing as well as 2- and 4-in. Byers tubing are being utilized in the renovation and expansion program.

promotions, adult group demonstrations, and regular home service home calls.

Evaluation of the students' own demonstrations by the utility's home service staff, and training in voice projection, enunciation, and platform techniques were also part of the Southern Counties summer home service training program.

Arizona PSCo. erecting building for Univac

Arizona Public Service Co.'s Univac, an electronic brain, will have a home of its own when construction of a new building in Phoenix is completed.

The $400,000 building comprises 21,000 ft of floor space with 14,000 sq ft on the ground level and 7000 sq ft on the second floor. The Univac operation will take up half of the first floor area.

Completely air conditioned, the building will include three 60-ton refrigeration units, capable of producing more than 150 tons of ice per day.

Another feature of the building will be the special lighting in the Univac portion. The working areas will feature high level illumination through the use of luminous ceilings. The Univac room will have medium level illumination with special fixtures to reduce reflection.

A unique factor in the construction of the building is the visitors' gallery. One wall of the Univac room will be glass from floor to ceiling to provide a viewing area for the public. This gallery will have low level illumination to give visitors a better view of operations. This type lighting also lowers the operator's visibility of spectators, thus lessening the problem of distraction.

Gas company must pay costs of rebate

Gas Service Co. will have to pay the handling cost of rebating a total of $2,555,376 to its Missouri customers, the state Public Service Commission has ruled. Cost of making the rebate has been estimated at about $115,000.

The rebate is part of more than $5 million Gas Service received from its principal supplier, Cities Service Gas Co., after a rate decision by the Federal Power Commission.

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High Strength Cast Iron Tee Head Bolts and Nuts

Write for Information and Prices to:

CADILLAC CAST PARTS CO.

Subsidiary of
Cadillac Malleable Iron Co.
Cadillac, Michigan

Gas Service has proposed it be allowed to reduce the rebate total by 4 per cent and use the deducted portion to pay the costs of making the rebate. It figured the cost would amount to 33 cents for each rebate no matter how small the amount of the check.

The commission ordered the rebates based on the volume of gas used by each customer—industrial, commercial, and domestic—during the affected period, October 1954 through April 1956.

Con Edison issues news-type publication

A newsletter-type publication, *Gas News*, now is distributed by Consolidated Edison Co. to plumber-dealers who sell, install and service gas heating equipment in its New York territory.

Gas News supplements personal contact between Con Edison representatives and the trade to keep plumber-dealers informed on latest developments and news of general interest in local gas heating sales and servicing. It will be issued periodically, whenever Con Edison has information of interest to pass along.

For a number of years Con Edison has vigorously promoted residential gas househeating in the single and two-family home market and recently has also aimed at gaining new gas heating customers in certain categories of the apartment house field.

Highlighted in the first issue of *Gas News* was the steady upward trend in favor of gas heating in Con Edison's gas service area. In the first six months of 1956 gas heating sales in the territory totaled 6484, compared to 4326 in the first six months of 1955.

Twenty-two per cent of gas heating sales in the first half of the year replaced coal installations, 52 per cent replaced oil, and 26 per cent went into buildings which had no previous heating plants. Also, the number of gas jobs lost to competitive fuels dropped sharply —down about 50 per cent from the first six months of 1955.

Siegler Corp. enters air conditioning field

The Siegler Corp., Chicago and Pasadena, Calif., has entered the central air conditioning field through its recent acquisition of the Kinnaire Corp., Anaheim, Calif.

The acquisition, terms of which were not disclosed, brings Kinnaire, a manufacturer of central air conditioning equipment for residential use, into Siegler's corporate structure. According to John G. Brooks, Siegler president, the move "provides the company with its first air conditioning operation wholly compatible with the forced air central heating equipment of our Holly division, and with the concentric growth objectives of the Siegler Corp."

Roper's annual report receives recognition

Financial World, a leading financial publication, has presented a merit award to the Geo. D. Roper Corp., Rockford, Ill., in recognition of the company's 1955 annual report to shareholders.

The citation was given "for distinguished achievement in annual reporting for two consecutive years and in recognition of the excellence of its 1955 annual report. . . ."

You can't afford not to use

CARBOSEAL
BRAND
ANTI-LEAK

to stop leakage due to dried-out fiber packing in cast-iron mains

EFFECTIVE
INEXPENSIVE
LASTING
EASY AND ECONOMICAL TO APPLY

Write *today* for booklet 4506—or the 16mm. color-sound movie, "CARBOSEAL Anti-Leak Stops Gas-Main Leakage."

CARBOSEAL ANTI-LEAK

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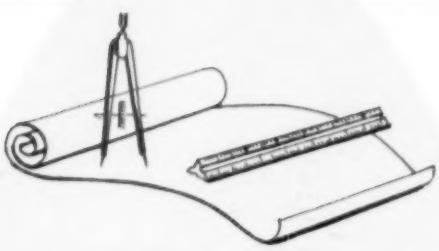


ENGINEERING WITH IMAGINATION

It was a housewife who first voiced the idea of Center Simmer (2 in 1) burners. And it was the creative genius of the founder of Harper-Wyman Company that transformed that vague wish to the most popular, largest selling deluxe top burner* today. That tradition of leadership continues . . . as is evidenced by the parade of new products for the advancement of the gas industry.

*HARPER ALLTROL Center Simmer Burners are used on 38 of North America's leading gas ranges.

Use the BIG "H" to make gas range sales come fast and easy!

It's HARPER engineering research and precision construction. . . the BIG "H". . . that makes the *big* difference in gas ranges today. You *know* that where there's "top" performance in top-of-the-stove cooking, it's the result of specialized Harper know-how. While you won't likely see a BIG "H" stamped on the heart of your modern gas range, you can be sure it's there. And it means features you can demonstrate for faster, easier selling.

FREE DEMONSTRATION IDEAS ON REQUEST

ALLTROL CENTER SIMMER

HARPER-WYMAN COMPANY

8550 Vincennes Avenue • Chicago 20, Illinois

ORIGINATORS OF CENTER SIMMER BURNERS

It pays to demonstrate the "heart" of your modern gas range . . .

HARPER ALLTROL®

CENTER SIMMER BURNERS

- **Instant, positive, accurate heat control**
- **Not just 6 or 7, but infinite heat settings**

Look at the facts: these gas range top burners have the instant flexibility and low heat control most homemakers want . . . they are troublefree indefinitely, and so easy to clean. But that's only part of the story. They just simply out-perform all other burners, regardless of fuel. And that's something you can demonstrate on the sales floor—to get the name on the dotted line easier, faster!

write for

FREE BOOKLET

Send today for the interesting, pocket-size sales manual, "How to Sell More Gas Ranges."

HARPER ALLTROL® CENTER SIMMER BURNERS *"Click"* with Modern Homemakers

Instant Full Flame . . brings food to cooking temperature in shortest time.

"Click" . . . convenient Low Frying Heat for uniform browning.

"Click" . . . efficient Center Simmer maintains boiling in any covered utensil.

"Click" . . . Keep Warm Heat retains food flavors without further cooking.

HARPER-WYMAN COMPANY • *Originators of Center Simmer Burners*

DEPT. 106-G • 8350 VINCENNES AVE. • CHICAGO 20, ILLINOIS

Roper's financial statement was also judged as among the "most modern from the standpoint of content, typography and format of the 5000 annual reports examined during 1956."

The report qualified for final judging in one of 100 industrial classifications, and became eligible for an "Oscar of Industry" trophy.

Arkansas towns planning gas distribution lines

Three east Arkansas municipalities which plan to build their own gas distribution systems have applied to the Arkansas Public Service Commission for permission to serve the surrounding rural areas.

The municipalities are Clarendon, Marvell and Holly Grove. They will build a line, starting from the system of Texas Gas Transmission Corp. south of Helena, which will run along Highway 20 to Marvell and Holly Grove and along Highway 79 to Clarendon.

Clarendon will pay $476,000 for the construction, Marvell $435,000, and Holly Grove $100,000.

Although the PSC does not have jurisdiction over municipally owned systems within the towns, it does have authority over rates and service outside city limits. Rates filed with the PSC list a $1.50 minimum bill for residential and small commercial customers and a charge of $1.15 cents per Mcf up to 2500 cu ft.

Idaho gas distribution plans upheld by court

In a memorandum decision expected to be appealed to the Idaho supreme court, Bonneville County District Judge Henry S. Martin upheld steps taken by the city of Idaho Falls to further a natural gas distribution program by a local cooperative.

The ruling was given in a "friendly suit" brought by J. W. O'Bryant under an Idaho statute which provides for the trying of such cases where there is doubtful legality. The suit raised a question as to whether the proposed cooperative would affect his right as a taxpayer and prospective user of natural gas. Defendants in the suit were the mayor, the city council, the co-op and its directors.

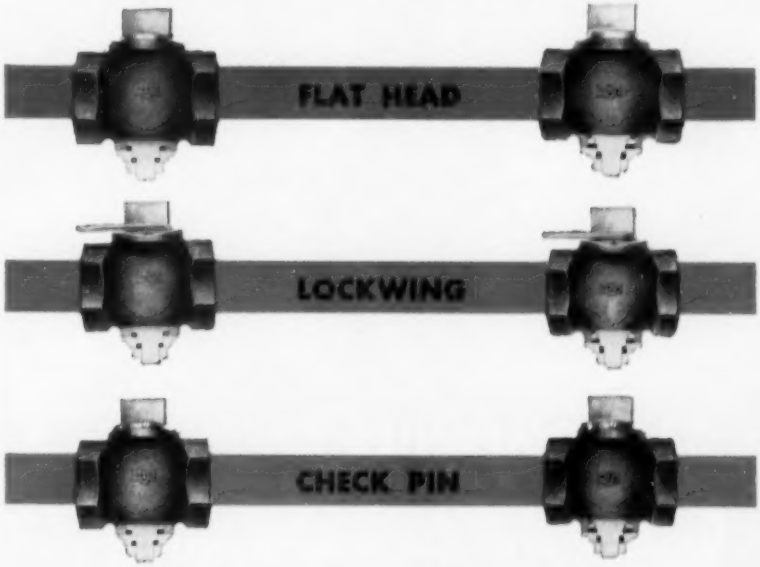
Judge Martin defined the issue

RIGHT on the LINE

HAYS STOPS FOR SERVICE LINES · METERS · APPLIANCES

REGULAR PATTERN — Full Range of Sizes — "KEY-LOK" TAMPER PROOF

Iron Body with Brass Plug ... Black or Galvanized



Quality Assured — By Precision Machining ... Individual Testing ... Rigid Inspection

Quality Proven by Supplying the Gas Industry for Over 80 Years

Hays also manufactures a full line of all brass stops

STANDARD PACKAGING

Another Hays First for Easy Handling... Space Saving Storage

Write for Literature or ask "The Man From Hays"

HAYS® GAS SERVICE PRODUCTS

HAYS MANUFACTURING CO.
ERIE, PA.

as: "Is the City of Idaho Falls incurring any indebtedness, liability or obligation or lending its faith and credit in the sense that the terms are legally applied, contrary to constitutional provisions?"

Concerning this point, the ruling declared that the plan to issue bonds to finance the gas distribution system was not submitted to qualified electors, but the decision further said that the city is not the moving party.

"The association," the decision said, "proposes to sell the bonds, build the system, get the members and distribute the gas and nowhere can I find any liability assumed by the city for such actions; nowhere can I find where any segment of the population of the city will be taxed for it.

"The only revenue will be from sale of gas which is not taxation but a service charge."

The decision says the co-op does not intend to sell gas to the public but only to members of the co-op and that gas will be sold to members at a "reasonable rate."

"The evidence is ample that the plan is feasible and practicable," the judge declared.

"Your servant seven ways, seven days a week"

Mrs. Jeanne P. Dabney, division home service director for Southern Union Gas Co. in Albuquerque, grossed $250 in prize money in the company's recent slogan contest with her entry, "Your Servant Seven Ways, Seven Days a Week."

Launched to stimulate employee interest in informing the public of the merits of natural gas, the contest offered $1190 in cash awards and drew an overwhelming response of 985 entries from the company's 1800 employees.

Grand prize winner, Jeanne P. Dabney, Southern Union's division home service director, Albuquerque, is presented with a $250 check and the congratulations of the gas company's president, C. H. Zachry.

The contest was opened to all regular employees of the Dallas-headquartered company except members of the business development department. Contestants were permitted to submit as many entries as they wished and all entries were mailed to a post office box in Dallas, processed and given number identifications to insure anonymity in judging.

In addition to the winning slogan, the contest produced 32 other top-ranking entries, with first, second and third prize winners in each of Southern Union's 10 districts and the Dallas headquarters. It revealed not only a tremendous amount of employee enthusiasm, but offered many potential ideas for future company promotion.

DITCH-WITCH is perfect for digging fast, economical service line trenches either 4½" or 6" wide . . . faster than a 10 man crew. Digs clean, even trenches, does not "tear up" customer's yard or lawn.

Praised by gas companies everywhere for its ability to dig in all types of soil, several operate as many as 12 DITCH-WITCH trenchers.

NOTE THESE OUTSTANDING FEATURES

- **Lightweight DITCH-WITCH is easily maneuvered—operated by one man—moved quickly to next job—fits easily into pickup truck.**
- **Minimum amount of spoils removed cuts down backfill operation. Pneumatic tires and ball bearings allow free movement and lawn protection.**
- **Low initial costs start at $795.00 f.o.b. factory. Operates for a few cents a day. The DITCH-WITCH often pays for itself on the first job.**

Write today for fully illustrated literature and how you can try the DITCH-WITCH on your job.

THE CHARLES MACHINE WORKS 640 S Street, Perry, Oklahoma

Tour acquaints dieticians with SoCal operations

More than 20 dieticians and nutrition experts from local organizations toured the facilities of the Flower street headquarters of the Southern California Gas Co. in Los Angeles recently.

Representing hospitals and health agencies from Los Angeles and surrounding cities, the group of food authorities was hosted by the gas company's dietician, Margaret Stewart. Speaker following luncheon was P. R. Shea, general sales manager for the company.

The day-long tour for the visiting dieticians was one in a series of a continuing program by the utility to acquaint local groups and organizations with its operations.

During their visit, the dieticians inspected the gas company's kitchen planning bureau, telephone service bureau, dispatch offices and a commercial cooking equipment display of the type used by hospitals and other large, mass feeding establishments.

Chart lists 67 new features in ranges

The wide array of special features—67 in all—available in today's modern gas range is detailed in a reference chart brought up to date by the utilization bureau of the American Gas Association.

Thirty-six manufacturers are listed along with the various features available on their ranges. Special features are limited to those which are in greatest demand. The "Gas Range Feature Finder" does not attempt to show combinations of features on specific models. Detailed information is available from manufacturers listed in the six-page guide.

This year's chart has been expanded to include one full page of dimensions for built-in and stack-on units. Free-standing ranges are given in overall widths and depths.

Another full page is devoted to listing colored enamel and metallic finishes in line with the increased demand for color in the kitchen.

All of the ranges listed in the feature finder carry the "Seal of Approval" granted by the AGA Laboratories.

The six-page chart is available from the utilization bureau, American Gas Association, 420 Lexington Ave., New York 17, for 10 cents a copy.

Maintains fast "work-and-run" schedule

DRIVES ANYWHERE — *Automotive-type steering and big, hydraulic, truck-type brakes give safe travel over streets and highways. Overall width is only 6 feet.*

BACKFILLS ITS OWN TRENCH — *Equipped with 6-foot blade (optional), Trenchmobile completes the job — with one-man, one-machine economy. Also check Parsons complete line of crawler-mounted Trenchliners®.*

To step up work schedules on all those scattered, small-yardage trenching jobs around town, look into the mobility and big production capacity of Parsons Trenchmobile. It drives cross-town, through traffic at 12.6 m.p.h. — works fast, too. Digs up to 14½ feet of trench per minute, 8 to 16 inches wide, at depths to 5 feet. Gets the job done in a hurry — drives on to next job *right* now. No waiting for trailer—no loading or unloading delays.

You also save a lot of hand clean-up. Trenchmobile undercuts walks, curbs and gutters, existing mains — makes vertical set-ins, flush with buildings and foundation walls. Positive down-crowd boom starts cut fast, holds accurate grade. Shiftable, reversible spoil conveyor dodges trees, hedges, poles, other obstructions. How about a Trenchmobile demonstration on your work? Parsons distributor will gladly arrange it. See him, or write us.

to: PARSONS COMPANY, Newton, Iowa
Send bulletin on 43.6 HP Model 88 Trenchmobile.

NAME_____

TITLE_____

COMPANY_____

DIVISION_____

STREET_____

CITY, STATE_____

P674 GAS

PARSONS TRENCHMOBILE®
(Ransomes Subsidiary)

Sign contracts for Florida gas service

As Federal Power Commission hearings resumed on the application for the first natural gas pipeline from Texas for statewide Florida service, three major developments in supply and marketing contracts were announced.

1. Gas contracts were signed by the Florida Power & Light Co. with Houston Texas Gas & Oil Corp., Sun Oil Co., Magnolia Petroleum Co. and the La Gloria Oil & Gas Co. for 100 MMcf/day of gas—one of the largest gas contracts ever made for a single industry.

2. The Houston corporation also executed a service agreement with the largest gas company in Florida, Peoples Water & Gas Co., and the Tampa Gas Co., a unit of Peoples.

3. Completion of gas supply contracts assuring more than 100% of the 20-year requirements of the pipeline to Florida brought the proved reserves under direct purchase and transportation agreements of Coastal Transmission Corp. to more than 1850 billion cu ft.

F. E. Stanley, president of Houston Texas Gas, builder and operator of the line from Baton Rouge, La., to south Florida, announced the execution of the contracts. W. J. Bowen, president of Coastal, builder of the line from Texas and Louisiana fields to Baton Rouge, announced the substantial increase in gas reserves available to meet the demands of Florida.

"The completion of the negotiations and the signing of gas contracts by Florida Power & Light Co. with Houston Texas Gas & Oil Corp. is a significant step toward the certification of Houston's proposed pipeline," Mr. Stanley said. "Houston proposes to construct a 24-in. . . . line from Baton Rouge to Miami at a total cost of approximately $95 million. Coastal . . . will construct a 24-in. natural gas pipeline from the lower Rio Grande Valley of southwest Texas to Baton Rouge at a total cost of approximately $53 million, to supply Houston its natural gas requirements."

Both companies propose to start construction early in 1957 after certification by the FPC. As soon as Houston Texas Gas receives its certificate, according to Mr. Stanley, the company will establish its home office in Florida.

no matter what the installation . . .

VIBRA-PAK ANODES ARE BEST!

Proved on every type of installation — under every soil condition — Vibra-Pak anodes get the job done better because:

1. SPECTROGRAPHICALLY ANALYZED
Guarantees exact specifications.

2. THIN SPIRAL CORE
Perfectly bonded — assures maximum efficiency.

3. UNIFORM BACKFILL
Provides even distribution for added anode life.

Be sure to specify VIBRA-PAK on your next anode installation.

Standard Magnesium Corporation

P. O. BOX 1424G • TULSA, OKLAHOMA

Mrs. America finals moving for 1957 judging

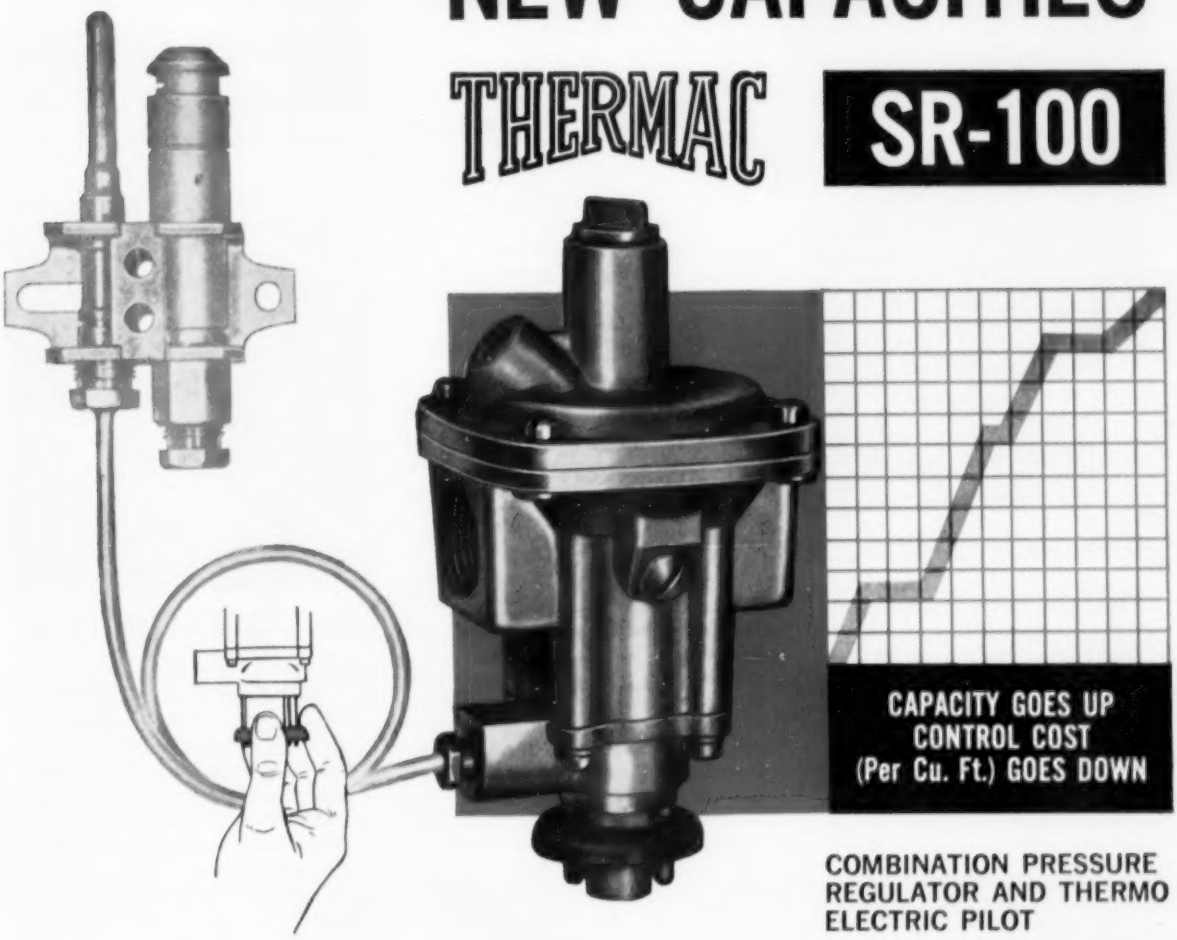
The grand finals of the 1957 "Mrs. America" contest will be held in Fort Lauderdale, Florida, according to Bert Nevins, president of Mrs. America Inc., which conducts the annual homemaking competition. The site of the finals are being moved from Ellinor Village, Daytona Beach, Florida, where they have been held for the past three years because of a change in the format of the final judging and better facilities that are available in Fort Lauderdale. Next year will be the 19th edition of the event, with the week long "Mrs. America" Pageant scheduled for May 7-14, 1957.

The American Gas Association for the fourth successive year will conduct the city, county and state eliminations at gas utility companies throughout the country, with 49 of the nation's top homemakers from every State in the

Announcing

NEW CAPACITIES

THERMAC SR-100



COMBINATION PRESSURE REGULATOR AND THERMO ELECTRIC PILOT

AGA Certified

THERMAC HM COMPANY

800 East 108th Street
Los Angeles 59, California

24 years experience building gas controls.

Responsibility of leadership in the controls business demands constant research and progress for improvement in product performance and lower cost. This, we have achieved and proudly offer to appliance engineers.

Our engineers have built into the Thermac SR-100 a new ability to handle a broader range of furnaces and appliances. So marked is this increased capacity that now the SR-100 can be used where here-to-fore a more expensive control has been required. This increased capacity is not a mere "technical" increase of 5% or 10% but a great deal more, as will be observed when testing the new unit.

Carrying A.G.A. Certification and patent application, the unique method which we employ to increase flow capacities is now a part of all SR-100 controls at no extra cost.

You are invited to request samples of this new SR-100 for testing and comparison.

Gar Wood cuts winch maintenance in half !

Design makes the difference!

Gar Wood winches outperform every other make . . . give you greater safety . . . *yet require only half the maintenance!* Here's why:

- ***Aluminum housing can't rust.*** You get corrosion-free operation in all climates, under all weather conditions. And, aluminum means less weight, more payload, faster heat dissipation.
- ***Ball bearing worm shaft.*** Self-contained Ball Thrust Bearings never need adjustment.
- ***Fully-enclosed clutch.*** Protected against dirt and weather, clutch can't stick or freeze—ever!
- ***Bonded brake lining.*** Provides longer life, increased braking area.
- ***All moving parts run in oil.*** Smooth, trouble-free operation.

There's a Gar Wood winch for every job . . . for every size truck. Call your Gar Wood-St. Paul truck equipment distributor for specifications of the world's most advanced line of winches. Or, mail coupon below.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Richmond, Calif.

MAIL FOR NEW BOOKLET

Customer Service Department G-5
Gar Wood Industries, Inc., Wayne, Michigan

Please send me the new, free booklet W-183 that illustrates the complete line of Gar Wood winches.

Name _____

Title _____

Company _____

Address _____

news • *Continued*

Union and the District of Columbia coming to Fort Lauderdale with their respective husbands for the grand finals. Mrs. America, Inc. has contracted with owners of the new Beach Club Hotel, soon to be erected in the Galt Mile area of Fort Lauderdale to house the finalists and their husbands during the contest week.

GAS news notes

The Pennsylvania Public Utility Commission has authorized United Natural Gas Co., Oil City, to extend natural gas service to the Blooming Valley area of Crawford county. Construction of 19,000 ft of 3-in. distribution at a cost of $41,000 is involved in extending service to the new area.

Challenge Manufacturing Co. of Los Angeles and Bryan, Ohio, has purchased the Heller Manufacturing Corp., Los Angeles. Challenge has announced it will increase production of the Universal trencher formerly made by Heller.

The Uniform System of Accounts for Gas Utilities is being reprinted because of the heavy demand for copies. The system is prepared by the committee on statistics and accounts of the National Association of Railroad and Utilities Commissioners and recommended by the association for adoption by the various state utilities commissions. It is available from the NARUC's official publishers, The State Law Reporting Co., 30 Vesey St., New York 7.

A two-story, 14,400-sq ft building will be the home of Spokane (Wash.) Natural Gas Co. when it is completed in Spokane in the next several months. Nathan H. Gellert Jr., president of the distribution company, said the building will be owned by MMM Inc., a firm of investors, and leased to Spokane Natural on a long-term basis. The building will be built of reinforced concrete and faced with brick.

The Siegler Corp., of Chicago, Ill. and Long Beach, Calif., has entered into an agreement to acquire General Water Heater Corp., Burbank, Calif., in exchange for cash and 40,000 shares of Siegler common stock.

CUT COSTS ON UNDERGROUND PIPING JOBS

...with a GREENLEE PIPE PUSHER

Installing pipe underground is quick and simple this way. With a GREENLEE Hydraulic Pipe Pusher *one man* pushes pipe through the ground—under streets, railways, walks, lawns, floors. Saves time, cuts costs through elimination of extensive ditching as just a short trench accommodates the Pusher. No tearing up of pavement, lawns, floors . . . eliminates tunneling, back-filling, tamping, repaving. Cuts job time to a fraction. Pusher often pays for itself through timesavings on first job or two.

No. 790 GREENLEE PUSHER For 3-4 to 4-inch pipe. Six speeds—5,600 to 40,000 lbs. pushing pressure.

No. 795 GREENLEE PUSHER For pipe larger than 4-inch, concrete sewer pipe, large drainage ducts. Six speeds—25,000 to 150,000 lbs. pushing pressure.

POWER PUMP For both sizes of GREENLEE Pushers. Pushes pipe at rate of two feet per minute.

GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 1950 Columbia Ave., Rockford, Ill., U. S. A.

GAS people

W. M. Jacobs
Pacific Lighting

A. R. Bailey
SoCounties

ALAN R. BAILEY has been named senior vice president of Southern Counties Gas Co., Los Angeles. Until his recent appointment, effective Oct. 1, Mr. Bailey was assistant to the president of Pacific Gas & Electric Co., San Francisco. When Coast Counties Gas & Electric Co. merged with PG&E in 1954, he was vice president in charge of operations for Coast Counties.

W. M. JACOBS, vice president and assistant general manager of Southern California Gas Co., Los Angeles, has been elected vice president of the parent company, Pacific Lighting Corp. His new headquarters will be in San Francisco. Mr. Jacobs has been with the Pacific Lighting System since 1931, joining SoCal as an industrial gas service engineer.

GLEN E. FOSTER has been elected senior vice president of the Brooklyn (N. Y.) Union Gas Co. He was formerly a vice president and is a director of the company. Newly elected vice presidents are JAMES J. DEELY, GORDON C. GRISWOLD, and ROBB QUINBY. These men were formerly assistant vice presidents.

D. V. KRIEGER has joined Maxitrol Co., Detroit, as sales engineer. He will cover Minnesota, Wisconsin, Iowa, Illinois, and Missouri.

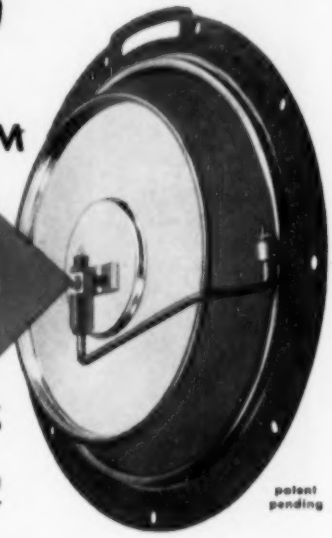
HARRY V. WENGER has joined Selas Corp. of America, Dresher, Pa., as Pacific northwest sales representative. He will open a new sales territory, which includes Seattle, Portland, Vancouver and Spokane. He will headquarter in Seattle.

PAUL L. DAVIES, San Jose (Calif.) industrialist, is a newly elected director of Pacific Gas & Electric Co., San Francisco.

Saves installation time—assures greater meter accuracy

New Lancaster S-700

featherweight action
LEATHER or SYNTHETIC
COMPLETE DIAPHRAGM
with
built-in adjustable carrier wire assembly



- **First and only complete diaphragm, perfectly centered in the meter, with every stroke evenly divided.**
- **Smoother, featherweight floating action with lightweight center assembly.**
- **All adjustment is at center pan screw . . . with carrier wire assembly fastened to diaphragm outer flange instead of meter case.**
- **Gaskets are already cemented to metal rim for ease of assembly — no hole aligning.**

Here's a real advancement in gas meter accuracy. This exclusive Lancaster development assures a perfectly centered diaphragm with the same even stroke on every revolution. The carrier wire assembly is an integral part of the diaphragm and is adjustable in both vertical and horizontal directions and for variations in meter case thickness. No bending of carrier wire is necessary. It all adds up to far greater accuracy in gas measurement.

Send for sample today

Lancaster METER PARTS CO.
Manufacturers of Quality Parts for Gas Meters
POST OFFICE BOX 378 LANCASTER, OHIO

1897 1956

PIPE STOPPERS OF ALL KINDS

SAFETY GAS MAIN STOPPER CO. INC.

GOODMAN
USED SINCE 1897
2" HANDLE & LOCKING SLEEVE
GAS MAIN STOPPER

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Brooklyn 17, N. Y.
Cable Address GASTOPPER, N. Y.

UNMATCHED ACCURACY

in a package

Everything you need . . . for field instrument calibration

MERIAM Manometer Kits

- Magnifying sight glass
- Mirror for resolving parallax
- Built-in level indicator
- Precision-bore pyrex tubing
- Built-in fluid seal
- All stainless steel construction

Write for Bulletin B-2862.

Meriam Manometer Instrumentation ...for pressures, vacuums, flows, liquid levels

meriam

INSTRUMENT COMPANY

10920 Madison Ave. • Cleveland 2, Ohio

people • *Continued*

DONALD J. PORTER, director of the Central Bank of Grand Rapids, Mich., has been elected a director of Consumers Power Co., Jackson, Mich.

The board of directors of Public Service Electric & Gas Co., Newark, N. J., has accepted the resignation of WILLIAM H. SPEER as a director and elected WATSON F. TAIT JR. to fill the unexpired term.

ALBERT L. BELLINGER has been appointed sales engineer by The Condit Company. Mr. Bellinger, formerly with the Pittsburgh Valve & Fittings Co., will work out of the firm's Tulsa headquarters.

A. KING MCCORD has been elected president of Westinghouse Air Brake Co. Mr. McCord succeeds E. O. BOSHELL, who has been serving as both chairman of the board and president since joining the company in 1951. He retains his chairmanship. Mr. McCord formerly was president of the Oliver Corp.

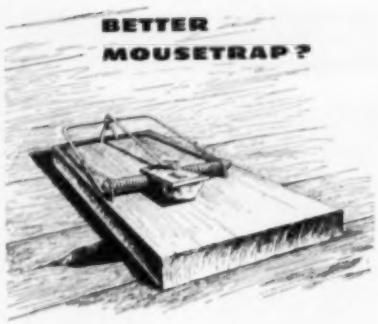
JOHN MADDEN, JR., has been appointed sales agent in charge of the New York office of United States Pipe & Foundry Co., Birmingham, Ala. He succeeds GEORGE T. OVERHOLT, who retired recently.

IVAN E. BALL has been elected vice president and comptroller of Peoples Gas Systems, according to Peoples Water & Gas Co., North Miami, Fla. Mr. Ball joined the company in 1948 and has served as comptroller of the east and west coast divisions of Peoples Gas System.

Niagara Mohawk Power Corp., Buffalo, N. Y., has elected J. LEO WELCH to a vice presidency. He becomes head of all gas and electric operations for the system. RALPH C. SEITZ has been named gas sales engineer for the company, succeed-

A. L. Bellinger
Condit

A. K. McCord
Westinghouse



THE story of the reward for a better mousetrap is proverbial. But the fact remains that most mice are still caught by this simple, economical and effective contraption.

Gas purification is a parallel case.

Iron Sponge, preferred for the removal of H_2S seventy-five years ago, is still preferred today. And for these same reasons . . . simplicity, economy and effectiveness. Iron Sponge operates with high efficiency at high or low pressures, has excellent capacity and activity, gives long service between foulings and is simply and quickly regenerated.

CONNELLY, *Inc.*

3164 S. California Avenue
Chicago 8, Illinois
Elizabeth, N. J.

ing RALPH L. MANIER who has retired.

ROBERT H. LAWS has joined the staff of Commonwealth Services Inc., New York, as a consultant in the industrial relations department.

Central Illinois Light Co., Peoria, has elected A. WARREN EGGER comptroller and assistant secretary and HERBERT A. BLAIR secretary and assistant comptroller. JOHN V. MILLER and ROBERT L. ASHLEY were both elected to the positions of assistant comptroller and assistant secretary.

FREDERICK M. HOAR, public relations manager for ElectroData division of Burroughs Corp., Pasadena, Calif., has been named West Coast public relations representative for the company.

WILLIAM L. BYRNE has been appointed assistant manager of the sales and public relations consulting department of Ebasco Services Inc., New York.

MARCIA JEAN LIZZA has joined the editorial department of the Peoples Natural Gas Co. and New York State Natural Gas Corp., Pittsburgh, as a public relations representative.

Reorganization of top management of Southern California Gas Co., Los Angeles, has resulted in the advancement of W. R. DAVIS to executive vice president and R. R. BLACKBURN to senior vice president. Also announced are the promotions of A. W. STRONG, now assistant vice president, to vice president in charge of personnel and C. A. RENZ, presently manager of special services, to vice president responsible for special services and customers departments. The changes were made in view of the resignation of W. M. JACOBS, who is now vice president of the Pacific Lighting Corp.

R. R. BLACKBURN
So Cal Gas

W. R. DAVIS
So Cal Gas

a quality plus "tool"

for burning all kinds of GAS

WEBSTER KINETIC®

At no extra cost to you this burner now is furnished with a venturi tube and flame retention nozzle fabricated from *heavy gauge* steel. Longer life and smoother operation is assured from a lighter weight unit.

The heavy gauge chrome alloy nozzle is also standardized on the ROTONETIC and HC DYNETIC

This is just another example of Webster's ability to engineer and manufacture a more efficient and economical "tool" for burning gas. In its class no other commercial or industrial burner can compare cost wise with quality.

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WEBSTER ENGINEERING *Company*
TULSA 1, OKLAHOMA

Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

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people • *Continued*

Ruud Manufacturing Co. has made two staff changes in the Pittsburgh district sales office. EDWARD DAILEY is now commercial sales representative and CHARLES GORDON has moved from Cincinnati to Pittsburgh to cover the northwestern Pennsylvania area.

Pipecote Service Corp., Tulsa, has named JOHN L. GOFORTH as sales manager, replacing J. C. COOPER, who resigned. Also, JOHN R. HURT replaces BARNEY F. BEDFORD as secretary-treasurer.

FRANCIS W. SMITH has been named secretary of Arizona Public Service Co., Phoenix. He replaces CLARENCE A. HULSE who has retired as secretary and assistant treasurer after 40 years service. Mr. Hulse will remain with the company as a special consultant on financial and corporate matters.

J. L. Gabris
Robertshaw

D. Goldsberry
Charles Machine

J. L. GABRIS has been appointed assistant general sales manager of the cooking appliance controls division of Robertshaw-Fulton Controls Co. In his new position, Mr. Gabris will continue to be specifically in charge of commercial controls sales and will undertake assignments in the domestic field. His headquarters is in Youngwood, Pa.

DWAINE GOLDSBERRY has become assistant sales manager of the Charles Machine Works, Perry, Okla. He was formerly district supervisor for the Reda Pump Co.'s water pump division.

M. EVERETT BARNARD is the new manager of Carrier Corp.'s unit heater department, Syracuse, N. Y. He has been sales manager of the department since 1954.

JOHN V. GOODMAN, chief system geologist of Equitable Gas Co., Pittsburgh, has been elected vice

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Here's true accuracy with the exclusive TOLEDO receding die principle—best for deep sealing, smooth tapering pipe threads for 2½ to 4" pipe or conduit. Cuts standard, over or undersize threads. Excellent for steel, wrought iron, brass, copper or cast iron pipe. Simple construction—easy to set up and use. Take our tip—it's tops.

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This 75 lbs. power vise makes threading, cutting and reaming a fast, simplified operation when out on the job. Carry it practically anywhere. Sturdy tripod legs, self-centering jaws and quick-acting wrenchless chuck. Polished aluminum housing—dependable geared action—precision construction throughout. Get your order in early for this fast-moving profit maker.

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The wrench for everyday work load punishment. Unconditionally guaranteed TOLEDO quality. Sturdy frame and jaw, positive grip, quick easy adjustment. The wrench for your heavy-duty jobs. See it today. Try it out.

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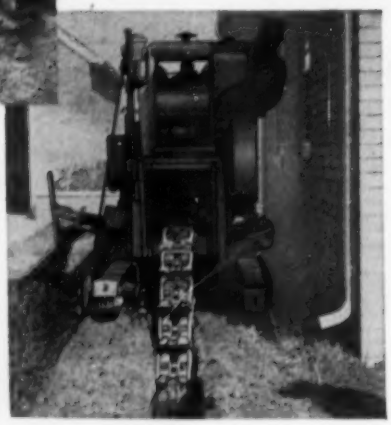
Made and warranted by one of the country's oldest, most reliable water heater manufacturers. Conshohocken, Penna. and Chicago, Ill. Approved by the American Gas Association and endorsed by Mrs. America®.

"POW-R-DITCHER IS SUPERIOR FOR SMALL MAINS & SERVICES"

Says "Bud" Somerville and Supt. Jim Godwin of the **SOMERVILLE CONSTRUCTION CO., Ada, Michigan**

"We have used several makes of ditchers and find the Vermeer 4T POW-R-DITCHER superior for installation of small gas mains and services. We get more footage with less destruction to landscaping. Our experience in this type of work covers a 15 year period and a great variety of ground conditions."



VERMEER 4T POW-R-DITCHER COSTS LESS . . . DIGS FOR LESS

This Vermeer "Midget Ditcher" is just the machine for laying gas pipe, service lines and digging foundation footings. Only 42" wide 6' high, 13' long. Digs 6" to 14" wide and can be transported in a pick-up truck. Same size moving parts as larger models. Write for name of distributor and full information on the complete POW-R-DITCHER line.

Some Excellent Sales Territory Available

VERMEER MFG. CO., Pella, Iowa

TELSCO FITTINGS DIVISION

5420 REDFIELD STREET **DALLAS 35, TEXAS**

people • *Continued*

president and chief system geologist. He will be responsible for all geological functions throughout the system, including underground storage well construction and well exploration.

J. V. Goodman
Equitable Gas

W. R. Curley
Royston Lab

Royston Laboratories Inc., Blawnox, Pa., has appointed WILLIAM R. CURLEY as sales engineer. From his headquarters in Monroe, La., Mr. Curley will represent the company in Louisiana, Mississippi, Arkansas, Missouri, and West Tennessee. Mr. Curley was formerly with Interstate Natural Gas Co., Hope Natural Gas Co., and Stuart Steel Protection Corp.

Gar Wood Industries' Findlay (Ohio) division has appointed ROBERT O'CONNELL as service manager. He was formerly with Clark Equipment Co. as assistant service manager of the industrial truck division.

H. CLIFFORD TAYLOR is now Elyria (Ohio) district manager for Ohio Fuel Gas Co., replacing CLAUDE F. BRONSON, who is retiring because of ill health. Mr. Taylor has been assistant manager of the district for the past four years.

R. R. ALLEN has been named vice president and director of engineering and research for the John Wood Co., Conshohocken, Pa.

Pacific Gas & Electric Co., San Francisco, has appointed HOETER C. NELSON and DONALD L. BELL assistant treasurers. Mr. Nelson, also an assistant secretary of PG&E, succeeds O. H. BARTHOL, who has retired.

MAURICE I. ROTH, JR., is filling the newly created position of sales manager for original equipment, liquid filters division of the Dollinger Corp., Rochester.

JOHN DILOT, advertising manager, Pacific Coast works of the A. O. Smith Corp., has retired from the company after 37 years of service. He was for many years in charge of advertising and public relations at the Milwaukee Works. He will continue in the public relations field as consultant with headquarters in Santa Barbara, Calif.

VERNE C. REDMAN has been promoted to the post of assistant division manager and KENNETH L. HAMPTON is now division commercial manager, succeeding Mr. Redman, in the San Joaquin division of Pacific Gas & Electric Co.

Deaths

HAROLD E. CHAPLER, 60, a veteran salesman and sales executive in Minneapolis-Honeywell Regulator Co.'s heating division, died recently in Los Angeles. Mr. Chapler had been with Honeywell for more than 30 years and was sales manager of the firm's oil equipment controls sales division from 1945 to 1951, when ill health forced his partial retirement. After moving to California, he continued to handle specialized sales work in the residential controls field until his death.

RALPH D. JENNISON, 70, former president and board chairman of the New York State Electric & Gas Corp., died recently in Binghamton (N.Y.) City Hospital following a heart attack. He was a director of the company at the time of his death. Mr. Jennison had been identified with the public utility field for more than 46 years, including 41 years service with New York State and its former affiliates. He was president from 1941 to 1949 and board chairman from 1949 to 1955, when he retired.

MAURICE F. MONAHAN, manager of the commercial department of Brooklyn (N.Y.) Union Gas Co., died recently after a long illness. He was 52. An active member of the American Gas Association, Mr. Monahan joined BU in 1933 as a collector. From 1936 until 1941 he was supervisor of the credit and collection division for the Queens district. In 1941 he became manager of the division for both the Kings and Queens districts. Four years later he was appointed acting assistant manager of the commercial department and moved up to manager in 1949.

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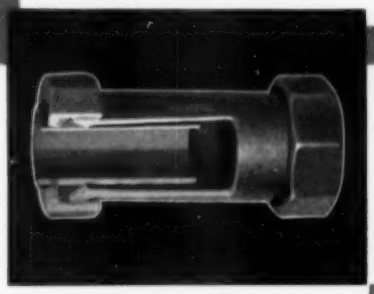
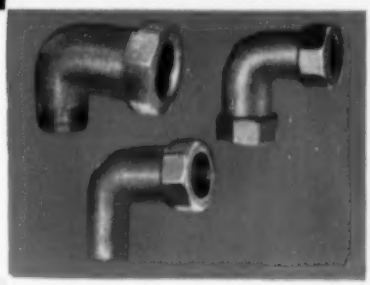
Couplings, Sleeves and Fittings for ☆ UNIFORMITY ☆ DEPENDABILITY ☆ ADAPTABILITY

Normac gas distribution products are engineered and manufactured to meet every requirement of modern gas distribution. Write today for catalog.

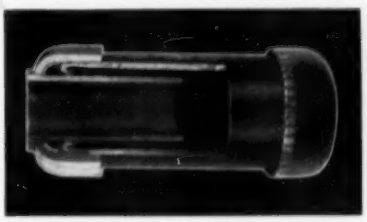


NORMAC COUPLINGS
Normac malleable couplings and sleeves offer the ultimate in deflection and strength with a center wall thickness greater than the wall thickness of the service pipe on which they are used. Every Normac fitting is individually air tested.



COMPRESSION-END "ELLS"
Normac ells of all types incorporate every feature of the Normac coupling plus full coupling depth.

COMPRESSION-END SERVICE "TEE"
Full coupling depth. Special threads on male end prevent dropping into old hand taps.



NORMAC #50-A STEEL COUPLINGS
Manufactured from extra heavy wall pipe. Couplings are available with either seamless or welded centers in sizes from ¾" to 1½" inclusive. 10' and special length centers available.

Normac also manufactures a complete line of red brass fittings in O.D. sizes: ⅜", ½", 1⅛", 1⅜"—and a complete line of insulated couplings and fittings.

NORTON-McMURRAY MFG. CO.
122 South Michigan Avenue — Chicago 3, Illinois

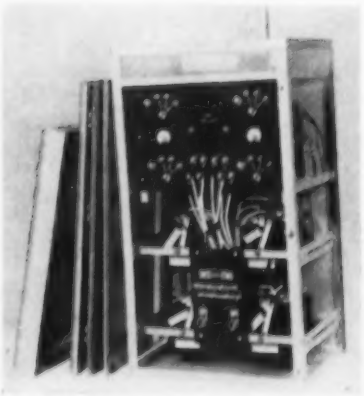
Couplings · Mipter Bars · Sleeves · Cocks · Ball Joint Clamps · Service Tees & Ells

Gas Digest

A digest of what's new in products and trade literature compiled by the editors of GAS as a reader service.

New Products and Trade Literature

For more data on any of these items use the Readers' Service Card on pages 115, 116



1. Rectifier

Goodall Electric's new custom line of cathodic protection rectifiers are highly compact, air cooled, light in weight and easy to install.

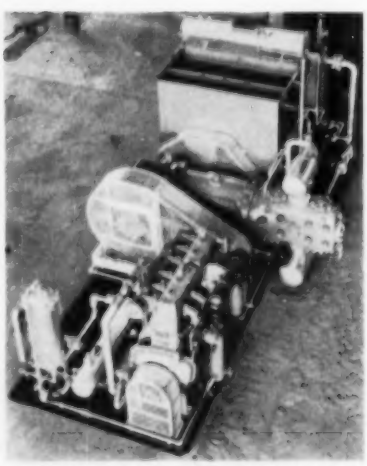
The case is new in design, with a simple hinged door for access to meters and adjustable controls. Either or both sides are removable by simply removing two or three self-threaded bolts. The top is also removable, if desired, and the entire case can be disassembled and reassembled by one man in less than five minutes. New transformer and panel designs are also featured.
Good-All Electric Manufacturing Co.

2. FM radio systems

Three high power, low band mobile FM radio systems have been introduced by RCA. One of the three is the company's first two-way radio engineered for a power output of 100 watts.

The new systems are designed to provide extended and improved coverage and more economical operation in low-band radio communication from 25 to 54 megacycles.

The high-power systems, incorporated in the RCA Carfone-50 mobile line, include the CFM-100B series for 100-watt output; the CFM-55 series for 55-watt output, and the CFM-40 series, for 40-watt output. They can be used for car-to-car and car-to-base station communications.
Radio Corp. of America



3. Packaged compressor

Introduction of new models of packaged gas compressors under 250 hp has been announced by Southwest Industries. Addition of the smaller units completes the company's line of packaged compressors.

The small units feature FMI' Cooper-Bessemer compressors of the same type used on larger ones, and are interchangeable with them. The heavy-duty, 300-rpm compressor provides the stamina needed for continuous operation. Any drive, electric, diesel, etc., can be used through the heavy duty, poly V-belt drive.

Engine, compressor, scrubbers, cooling and lubricating systems, and controls are mounted on a floored skid.
Southwest Industries Inc.

4. Crew compartment

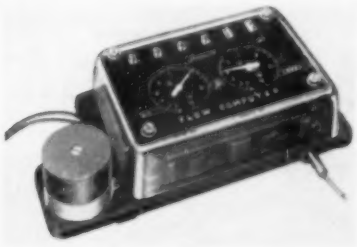
Increased visibility is now available on all crew compartments made by the J. H. Holan Corp.

As an optional feature, crew compartments have a curved corner window and another front window in addition to the standard side and long front windows.

The new corner window is made of 3-16-in. clear transparent plexiglass. It is 15-$\frac{3}{8}$-in. high, 9-3/16-in. wide on the side, and 6-3/16-in. wide on the front. Corner window is on the left side.

On the right front, the new win-

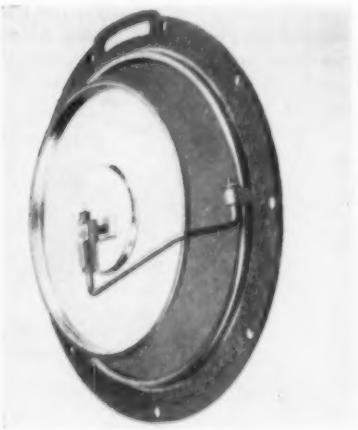
dow is made of 3/16-in. safety sheet glass 8-3/4-in. wide and 22-in. high. Both new windows are stationary and have rubber retainers.
J. R. Holan Corp.



5. Flow meter

A new integrating flow meter that simplifies computations in the orifice measurement of fluids has been announced by Librascope. Unique in design, it embodies the principle of pressure compensated double integration.

In action the computer extracts the square root and continuously integrates both differential and static pressures, without the use of cams or other intermittent devices. It is continuous, with full range compensation even below atmospheric, and provides accuracy where rapid pressure fluctuations are involved.
Librascope



6. Diaphragm assembly

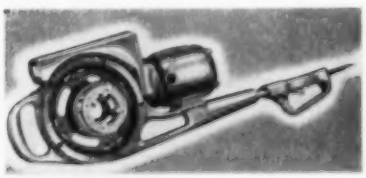
A new complete diaphragm assembly featuring a built-in adjustable carrier wire assembly is now being produced by Lancaster Meter Parts Co. This new S-700 diaphragm is available with leather or non-crack synthetic material.

The built-in carrier wire assembly is an integral part of the diaphragm itself, and fastens to the outer flange of the diaphragm instead of the meter case. The only adjustment necessary to compensate for variations in the meter case thickness is at the center pan screw. The S-700 is shipped with the gaskets already cemented to the metal rim, which eliminates hole aligning and speeds up installation.
Lancaster Meter Parts Co.

7. Trencher

The Challenge Universal trencher digs trenches up to 4-ft deep and 14-in., 16-in. and 18-in. wide. Designed solely for utility trenching, the unit is hydraulically controlled.

Trencher model 3A-48 is designed for mounting on the Oliver OC-3 tractor. Model DA-48 mounts on the John Deere 40-C and 420-C tractors.
Challenge Manufacturing Co.



8. Power drive

The Toledo No. 68 portable power drive has been completely redesigned for easier operation and longer life. It can be used for pulling, lifting, threading and turning on a wide variety of jobs.

According to the manufacturer, the new frame is slightly heavier and more sturdy. New ball bearing design improves service life and minimizes maintenance. The No. 68, powered by a 115 v reversible ac or dc motor or 90 psi air motor, weights on 33 lbs.
Toledo Pipe Threading Machine Co.

9. Regulator

A new regulator which will withstand momentary overloads as high as 1000 psi on the outlet side has been introduced by Rockwell Manufacturing Co.

Designed primarily to provide extra safety for rural gas services—particularly where gas is piped directly to rural homes from high pressure lines—the new 141 regulator offers the highest capacity in its size ranges. Four interchangeable orifices and five interchangeable springs enable the regulator to operate on pressures ranging from 3 to 400 psi. Changes of settings in the 3 to 100 range are made by replacing the spring. A reducer plate must be used with the spring for the 200 to 400 psi setting.
Rockwell Manufacturing Co.

10. Pipe plug

A new device that can be inserted and securely locked into the open end of a pipeline or piping to withstand high pressures is now being made by T. D. Williamson Inc.

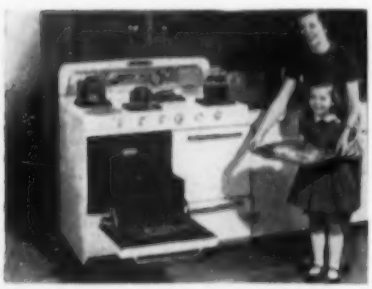
Known as the Wedge Lock Pipe Plug, it is used to pressure-up pip-

ing and vessels for hydrostatic or air testing and to propel pigs by compressed air. It also can be used to plug open pipe ends to permit welding without hazard of flammable vapors.
T. D. Williamson Inc.

11. Backhoe

The new TerraTrac backhoe, designed for use with TerraTrac crawler tractors, features 180° swing with independent hydraulic foot pedal control, enabling the operator to maneuver the bucket and dipper stick while swinging.

The unit digs 12½ ft deep, has a reach of 18 ft and clear dump height of 13 ft. Buckets from 17-in. to 24-in. are currently available. A bucket rollback of 90°, controlled by an extra large hydraulic pump, insures heaped loads without spilling.
American Tractor Corp.



12. Broiler

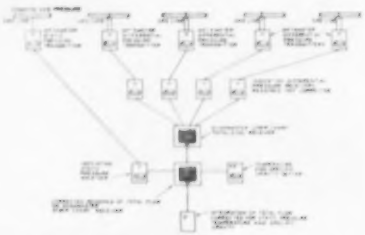
Broiling is easy and results are perfect in the new "Comfort Level" broiler of Roper gas ranges. Extra capacity accommodates largest cuts of meat.

Infra red heat from the Roper-Glo burner broils food from the inside out.
Geo. D. Roper Corp.

13. Rotary compressor

A new 85 cfm portable rotary compressor has been added to the Ingersoll-Rand line. The Gyro-Flo 85 weighs only 1840 lb, fully equipped with tool boxes, fenders and two-wheel spring mounted running gear. It also can be truck mounted.

The compressor is driven by a Continental F-140 gasoline engine. It is equipped with push button starting. The starter is powered by a 6 v battery system.
Ingersoll-Rand Co.



14. Telemetering system

Bristol Co.'s new system of telemetering instruments will totalize flow measurements, correct for such factors as temperature, pressure, specific gravity and supercompressibility in fluids, and provide a corrected flow value.

This system can be used wherever corrected flow values are vital for proper operation. These instruments can also be supplied in a variety of types to perform averaging, totalizing, multiplying, and dividing computations involving the basic measured variables. The computing systems are built up to fit a specific set of requirements from standard Bristol Metameter measuring transmitters.
Bristol Co.

15. Gas ranges

Caloric's new line of de luxe gas ranges are designed to make cooking easier, faster and better—and do it automatically.

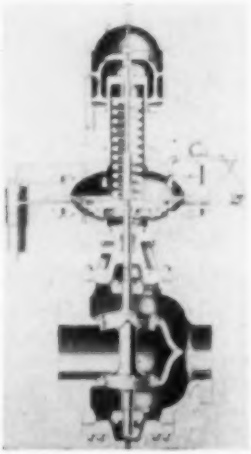
Known as the "One" Series, the ranges feature Caloric's Tri-Set 12,000 Btu top burners to provide fast cooking. A positive thermostatic control is optional.

Ovens have a capacity of 4300 cu in., and are insulated with fibreglass.
Caloric Appliance Corp.

16. Selenium rectifiers

A newly designed series of selenium rectifiers for cathodic protection has been announced by Corrosion Services Inc. The units come in four sizes and are air cooled.

The new units feature a door that opens downward, giving more protection to inspectors in windy weather; better ventilation for the rectifier stacks; parts and connections located in easily accessible spots, and cable openings at the rear of the housing.
Corrosion Services Inc.



17. Pressure regulator

A new high pressure regulator,

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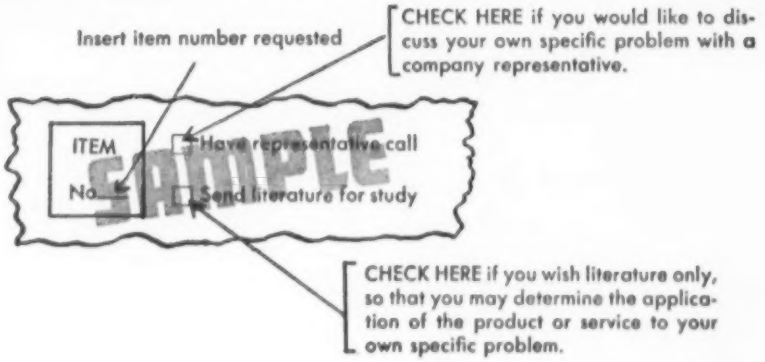
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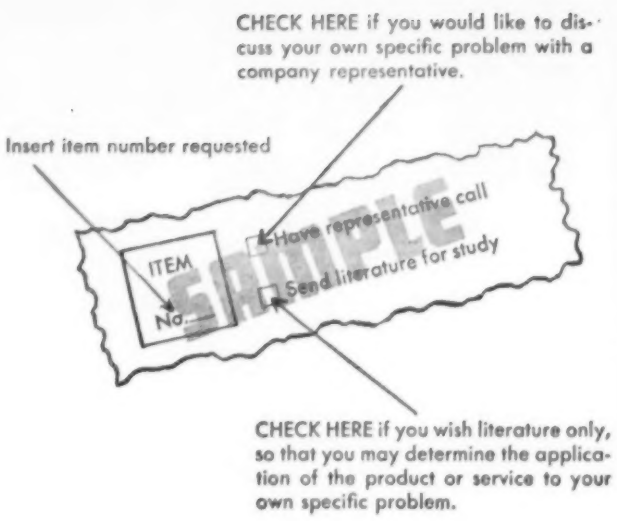
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said to solve the problem of vertical instability sometimes encountered on high pressure transmission lines, has been introduced by Fisher Governor Co.

The Series 883 and 885 regulators feature an oil dash-pot which will dampen out any tendency of the valve to jump. Diaphragm casings are capable of withstanding 1000 psi. Available in valve body sizes 2-in. through 12-in., the steel loading pilot is suitable for pressures up to 1000 psi and has an adjustable reduced pressure range of 100 to 450 psi.

Fisher Governor Co.

18. Line puller

The Pow-r Mole is a compact new device for pushing in gas lines and pulling copper or lead lines up to 3-in. in diameter under roads, streets, sidewalks, lawns or other surfaces. It replaces the bucket on any standard tractor-mounted hydraulic backhoe using the two bucket mounting pins.

Since the Pow-r Mole utilizes the power of the tractor to push or pull pipe, and down pressure on the backhoe boom stabilizes the unit while in operation, no other equipment is needed.

The attachment has a 4-in. stroke, and operates at up to 30 tons pressure.

Pow-r Devices Inc.

19. Wagon drill

A new Le Roi heavy duty wagon drill, with the feed shell behind the center line of the large wheel axles to provide a more substantial drilling carriage, is now on the market.

The DR40 has an air motor feed which eliminates most sticking of steel. It is designed for vertical or horizontal drilling in hard formations. The air motor on the unit produces 14 power impulses with every revolution.

Le Roi Div.

20. Wall furnaces

Peerless Manufacturing Corp.'s new line of wall furnaces are available in 25,000 and 35,000 Btu input single wall models, and in a 50,000 Btu input dual model.

A slotted port cast iron burner is featured on all models, and a wide selection of controls are available. All heaters meet the AGA requirements covering vented recessed wall heaters.

Peerless Manufacturing Corp.

TRADE LITERATURE

21. Control panel data

A new bulletin gives at-a-glance application information and lists special benefits in engineering assistance, design, installation, maintenance and field service of GE's Pan-A-Trol control panel. The four-color booklet also shows a case history of an installation.

General Electric Co.

22. Water heater bulletin

Rheem's new X-56 appliance styled water heater is described in a new 4 page brochure. The brochure emphasizes the design and color adaptability of the X-56, and also provides complete specifications on the water heater.

Rheem Manufacturing Co.

23. Compressor bulletin

A new booklet to help locate and correct common air-cooled and water-cooled compressor troubles has been released by Worthington Corp. A cartoon sequence pictures a full description of compressor troubles, from failure to deliver air to excessive oil consumption.

Worthington Corp.

24. Service cock data

A complete line of service cocks, meter and air cocks for moderate pressure services is described in a new 12-page bulletin (V-605) issued by Rockwell. Principal emphasis is given to Rockwell's "1092" tamper-proof service cock specially designed to eliminate tampering where a curb installation is involved.

Rockwell Manufacturing Co.

BORE with HYDRAUGER

(EARTH BORING MACHINE)

Designed for maximum control of the reamer. Earth along the pilot bits acts as a bearing to steady the reamer assuring an accurate hole.

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It will instantly locate all subsurface pipes, cables and such, and determine their depth too. The etched circuitry, our latest innovation, assures better quality control and performance than the customary hand wiring method. You can avoid damaged structures and loss of time with the Wilkinson Line Locator.

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Our instrument cases are now made with wear resisting phenolic material.

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GAS calendar

October

4 . . NEGA Appliance Servicing Conference—Hotel Statler, Boston.

8-12 . . National Metal Exposition — Cleveland, Ohio.

9-10 . . 4th Gas Measurement Institute (Co-sponsors: University of Kansas and southwest Kansas Petroleum Institute)—4-H Building, Liberal, Kan.

10 . . AGA Industrial & Commercial Gas Section Industrial Gas Breakfast—The Hollenden, Cleveland, Ohio.

15-17 . . AGA Annual Convention — Atlantic City, N. J.

17-19 . . Wisconsin Utilities Association Convention— Schroeder Hotel, Milwaukee.

22-26 . . National Safety Council — Chicago.

24 . . NEGA Accounting Division—Hotel Statler, Boston.

26 . . SGA Roundtable on Engineering Use of Electronic Computers—Shamrock Hotel, Houston.

31 . . NEGA Operating Division—Hotel Statler, Hartford, Conn.

31 . . NEGA Operating Division—Hotel Statler, Hartford Conn.

November

12-15 . . American Petroleum Institute—Conrad Hilton Hotel, Chicago.

14 . . AGA Industrial & Commercial Gas Section Commercial Gas Breakfast—Hotel St. Moritz, New York.

25-30 . . American Society of Mechanical Engineers — Statler Hotel, New York.

26-27 . . SGA Advisory Council and Management Conference — Point Clear, Ala.

December

Rocky Mountain Gas Association Annual Meeting—Denver.

1957

January

Pennsylvania Natural Gas Men's Association Annual Meeting—Wm. Penn Hotel, Pittsburgh.

18 . . SGA Employee Relations Roundtable Conference—Statler-Hilton Hotel, Dallas.

23 . . NEGA Operating Division— Hotel Statler, Boston.

25 . . SGA Accident Prevention Roundtable Conference—Tutwiler Hotel, Birmingham, Ala.

25 . . Pennsylvania Gas Association Mid-winter Sales Conference—Benjamin Franklin Hotel, Philadelphia.

31 . . NEGA Accounting Division—Hotel Statler, Boston.

February

3- 5 . . 27th Annual Mid-Winter Conference, Public Utility Buyers Group.

National Association of Purchasing Agents—Brown Hotel, Louisville, Ky.

4- 6 . . AGA Home Service Workshop—King Edward Sheraton Hotel, Toronto, Ont., Canada.

21-22 . . SGA Accounting Management Roundtable Conference—Roosevelt Hotel, New Orleans.

21-22 . . SGA Sales Executives' Conference—Roosevelt Hotel, New Orleans.

March

7- 8 . . SGA Distribution Management Roundtable Conference—Roosevelt Hotel, New Orleans.

11-15 . . National Association of Corrosion Engineers—Kiel Auditorium, St. Louis, Mo.

21-22 . . New England Gas Association Annual Meeting—Hotel Statler, Boston.

25-27 . . Mid-West Gas Association — Hotel Nicollet, Minneapolis.

28-29 . . Oklahoma Utilities Association Annual Convention—Tulsa.

April

8-10 . . National Conference of Electric and Gas Utility Accountants—Sheraton-Park Hotel, Washington, D. C.

8-10 . . GAMA Annual Meeting—The Greenbrier, White Sulphur Springs, W. Va.

8-11 . . AGA Distribution, Motor Vehicles and Corrosion Conference—Rice Hotel, Houston.

16-18 . . Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman.

16-18 . . AGA Sales Conference on Industrial and Commercial Gas—Jung Hotel, New Orleans.

24-26 . . Natural Gasoline Association of America 36th Annual Convention Rice Hotel, Houston.

24-26 . . Indiana Gas Association—French Lick-Sheraton, French Lick, Ind.

29-May 1 . . Southern Gas Association Annual Convention — New Orleans.

May

Natural Gas & Petroleum Association of Canada—Hotel London, London, Ont., Canada.

6- 7 . . AGA Residential Gas Section Eastern Sales Conference—Hotel William Penn, Pittsburgh.

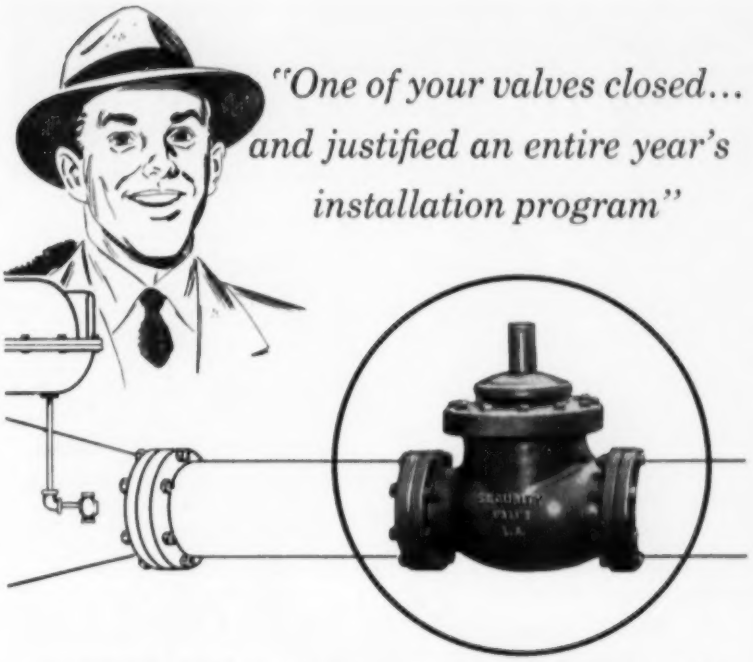
9-10 . . AGA Gas Supply, Transmission and Storage Conference—Mark-Hopkins Hotel, San Francisco.

15-17 . . AGA General Management Section Conference — Jung Hotel, New Orleans.

20-22 . . AGA Mid-West Regional Gas Sales Conference — Edgewater Beach Hotel, Chicago.

20-22 . . AGA Chemical, Engineering and Manufactured Gas Production Conference — Balmoral Hotel, Miami Beach, Fla.

21-23 . . Pennsylvania Gas Association Annual Meeting—Pocono Manor Inn, Pocono Manor, Pa.



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■ That's the experience of just one of the major gas companies and gas-using industries from coast to coast who have standardized on Security Automatic Shut-Off Valves. Because of their *absolute* protection against overpressuring, the operation of a single Security Valve can pay for a system-wide installation.

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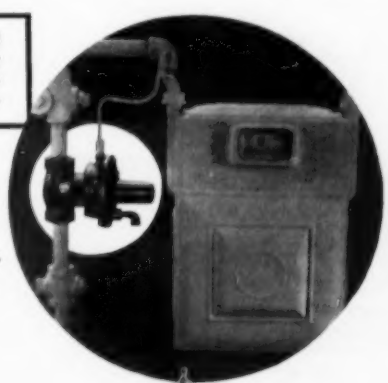
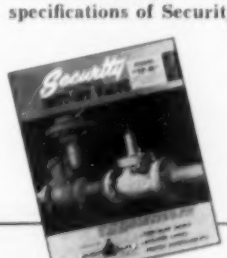
Security Automatic Shut-Off Valves range from ¾" for domestic lines (right) to large distribution line sizes (above).



Nationwide representation insures fast help on your gas safety problems. Write today for the complete story and specifications of Security Valves.



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Users tell us these completely new cutters are so efficient they often "pay for themselves" through the savings in crew time on a half-dozen cuts. They are the first really practical tools for cutting off steel or cast iron pipe in sizes from 2½" to 12". You can, for example, cut 8" steel pipe completely off in less than five minutes.

Four wheel design requires minimum swing of handle—less digging in ditch work, easier "tight-corner" cuts.

Closed frame permits light weight with complete rigidity for better cutting.

4-point guide aligns the cutter on the pipe . . . assures perfect tracking and a right angle cut.

Reed Razor Blade wheels track perfectly, cut easily and roll down burr on steel pipe.

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From an editor's field book—

(*Continued from page 8*)

Brooklyn Union Gas Co. added about 165,000 customers to its lines through consolidation of Kings County Lighting Co. and the New York & Richmond Gas Co. This makes Brooklyn Union a distribution company with over a million connected customers. The giant system has served people in Brooklyn and Queens for over 100 years.

Portland Gas & Coke Co., physically joined its distribution system with the Pacific Northwest Pipeline Corp.'s Scenic Inch project during mid-August. Well attended ceremonies impressed business men and the general public from all over the area. The Scenic Inch continues to roll while its northern kissin' cousin, Westcoast Transmission's pipeline, is going strong up Canada way. The latter will bring natural gas from 42 million acres of Canadian producing area to heavily populated areas in 1957.

Northern Illinois Gas Co will (1) promote the installation of dual-fuel heating equipment that can be fired with either natural gas and fuel oil or natural gas and propane-air, if the Illinois Commerce Commission approves; (2) construct an underground storage cavern to hold 10 million gal. of liquid-state propane, if the Illinois Commission approves; and (3) venture offshore in the Gulf of Mexico, with a group of Texans and some Chicago people, in a search for additional natural gas supply.

WOMAN'S HOME COMPANION presents the Companion House For Family Living—1956 in its September issue. Some features are: Coleman gas heating and air conditioning; Calcinator gas disposer; Crosley-Bendix gas dryer; Rheem gas water heater; Servel gas refrigerator; and Roper built-in gas top burners and gas oven.

Southern California Gas Co. of Los Angeles turning to electronics for distribution network analysis. They are the latest to install an analogue computer.

regulatory • *Cont'd.*

(*from page* 12)

deliver additional gas unless it was produced and gathered.

". . . . It was stated at bar, without contradiction, that since the passage of the Natural Gas Act in 1938 the Commission has never until the present case asserted power to direct a natural gas company to enlarge its transportation facilities or to sell and deliver gas beyond the capacity of such facilities. As the Supreme Court said with respect to the attempted exercise by the Commission of power in the field of production and gathering of gas:

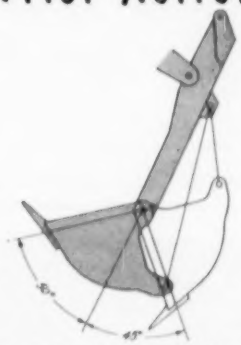
'Failure to use such an important power for so long a time indicates to us that the Commission did not believe the power existed'."

The Circuit Court of Appeals would not approve inadequate maintenance of a pipeline which reduced its original capacity to deliver gas, although ruling that FPC is powerless to compel a physical enlargement of a natural gas pipeline. The Court concluded thus:

"The Central West Utility Co., an intervener in this case, has filed a petition for rehearing which calls for brief discussion. Its principal contention is that the inadequacy of the Liberty lateral to deliver the volume of gas which the Commission's order would require Panhandle to deliver to Central West and other customers served from that lateral is due largely to the fact that Panhandle has allowed the lateral to fall into a condition of decay and disrepair. Central West urges that to the extent that the Commission's orders here under attack require Panhandle to restore the Liberty lateral to the capacity for which it was originally designed and authorized and which it at one time had, they are within the Commission's authority. With this contention we agree.

". . . When a natural gas company, after securing the approval of the Commission, has constructed or acquired a pipeline having a definite designed capacity it has an obligation in the public interest to maintain the pipeline in such good order and repair as to be able to continue to deliver the volume of

HYDROHOE'S Wrist Action Puts the Twist Where it Pays



You're always using the best penetration angle when you dig with Bucyrus-Erie Hydrohoe's wrist-action utilities dipper. Designed specifically for utilities work, this 20-in. wide dipper is hinged at the lower front end of the dipper handle and rotates hydraulically from 45 degrees behind the handle to 50 degrees ahead.

You change angle of penetration as you dig — simply by flicking a lever. The resulting larger loads, reduced spillage and maximum penetration gives you faster leak repairs, manhole excavations, valve pits. Trenches deeper than they are long can be cut with squared or undercut ends. Rocks are moved, and buried pipe or conduit uncovered with far less danger of damage. In addition to all this, the boom telescopes hydraulically to add reach and depth, and may save up to 40% of move-up time.

These tailored-to-your-work features combined with the Hydrohoe's light truck mobility, fast set-up, solid outrigger support, and quick convertibility to crane front-end sets it ahead of any ordinary excavator for on-the-go utilities work.

In addition to the special utilities dipper, the Hydrohoe is offered with a narrow-type 12-in. wide dipper, with the standard 18-in. wide dipper, and with wide-type dippers up to 60 inches. For complete information get in touch with your Bucyrus-Erie distributor. Ask him about the Hydrocrane, too.

151H56

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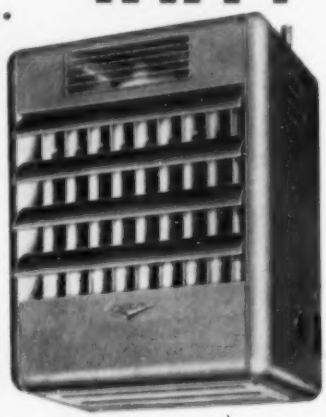

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gas for which it was originally designed and approved. And if it develops that the company can in actual operation safely and feasibly deliver a larger volume of gas through the pipeline than it was designed to carry this obligation of maintenance includes the duty to keep the pipeline in condition to deliver this larger volume of gas. If the company fails in its duty of maintenance the Commission . . . if necessary or desirable in the public interest, direct the company to improve its facilities by their rehabilitation and repair, or even reconstructon, to the extent necessary to restore them to their original designed and approved capacity or former actual capacity, as the case may be. For such action would clearly not involve an enlargement of transportation facilities within the ban of the proviso in section 7(a). And the same may well be true of a direction for the use in operating a pipeline of improved facilities which will increase its carrying capacity, provided a physical enlargement of the pipeline itself is not involved." ■

Washington • *Cont'd.*

(*from page* 15)

to reopen hearings on the eight-year-old Phillips Petroleum Co. case. It was the Phillips case which touched off the dispute over FPC control of independent natural gas producers, which wound up in the U. S. Supreme Court in 1954 and in Congress in 1955 and 1956, and finally stopped at the White House.

Phillips Petroleum seems destined to be the guinea pig in the independent gas production control battle. Since the Supreme Court has ruled FPC must take jurisdiction over Phillips' rates, and assuming no gas bill is passed before the rates are set, Phillips becomes the test case on which the commission will determine how it will go about exercising controls.

One major issue now is what constitutes a "fair" rate of return. Although 9 per cent has been talked of—as have figures running from 6 per cent up—it became the unofficial starting point for arguments last June when the commission staff, in reporting to a hearing

examiner, discussed what various prices would return to the company "assuming a 9 per cent return."

Now, the question is whether the hearing examiner and the FPC will go along with the 9 per cent return, which is in the nature of a compromise between demands for lower rates and claims of the producers for a rate which will cover all their costs of production.

Second major issue now is what type of base FPC will settle on when it applies the rate. The commision staff report said that "adjustments" were made for Phillips exploration expenses. They were allocated on the basis of average gross investment in producing leaseholds, which resulted in 15 per cent of total exploration expenses being allocated to dry wells. Other methods of allocation had been tested by the staff, but were thrown out.

In the other tough case, recommendations were expected soon from a hearing examiner on dismissal motions by opponents of the application of Midwestern and Tennessee Gas Transmission for permission to import gas from Canada. If the motions to dismiss fail, opponents of the application still are counting on delaying tactics—plus the normally slow movement of the commission — to help them block the project.

The already-complicated Midwestern-TGT case has now been further confused by an application of Colorado Interstate Gas Co. to build a pipeline from the west to supply Chicago markets (through a to-be-connected pipeline) with about 100 MMcf/day. This proposal could compete for some industrial customers with the Midwestern line.

Opponents say they are sure Midwestern will not get a certificate by the deadline for the Trans-Canada line, from which it would eventually get its Canadian gas. This would cause the bitterly disputed Canadian project to seek an extension, which it might or might not get in view of the white-hot controversy the project has stirred up among the Maple Leafers. ■

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No Flame — Safe Cuts Under Hazardous Conditions!
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WACHS BIG GUILLOTINE SAW FACTS—
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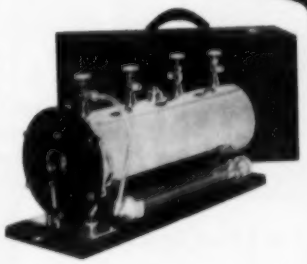
Designed and constructed to meet the specifications required for determining the specific gravity of gas under the various conditions found in both field and laboratory.
Complete line of accessories available.



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This instrument has been designed for accuracy in determining specific gravity of gas—it contains no rotating parts that will wear out and operates on the principle of weighing a volume of gas in comparison with an equal volume of air.

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GAS associations

Industrial gas uses displayed at metal show

Cleveland's public auditorium will be the locale of the 1956 National Metal Congress and Exposition during the week of Oct. 8, and once again the AGA's industrial and commercial gas section will sponsor one of the largest single exhibits at the show.

With seven cooperating exhibitors, the gas area will be seen along nearly 200 ft of main aisle in Lakeside hall where many interesting exhibits of industrial gas equipment may be seen under the Blue Flame banner. Stressing the uses of gas in industry for hot forming, heat treating, prepared atmospheres, metal melting and finishing, the exhibitors in the AGA combined exhibit will be host to well over 50,000 visitors to the trade show.

One of the highlights of the week will be the Industrial Gas Breakfast at the Hollenden hotel on Wednesday, Oct. 10.

Koenig ALL-STEEL CABS for JEEPS
FULL AND HALF CABS

Full Cab and Model 151J King Winch Illustrated

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Roll-down windows, full opening . . . full panel-board head lining and masonite door lining . . . safety glass throughout . . . all-steel welded construction . . . door locks.

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There's a front-mount King Winch designed to fit your specific needs . . . for ½-ton through 2½-ton trucks . . . pulling capacities of 8,000 to 19,000 lbs.

P.T.O.-driven King Winch on Willys Jeep FOR ALL WILLYS JEEPS, 4 WD TRUCKS AND 4 WD STATION WAGONS.

Power-take-off-driven King Winch models 130J and 131J for CJ-3B and older-model Jeeps, can be transferred to CJ-5 and CJ-6 Jeeps . . . nothing extra needed.

Koenig cabs and King Winches for Willys vehicles available through all Willys Motors, Inc., dealers and distributors in U.S.A. . . . and Willys-Overland Export Corp. distributors in other countries.

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Gas appliance group elects new members

Several companies have been elected to membership in the Gas Appliance Manufacturers Association. They are as follows:

All American Fabricators, Los Angeles—heater and range connectors and fittings; Barnes Heating Equipment Co. Inc., also of Los Angeles; Central D. Manufacturing Co., Culver City, Calif.—range, furnace and heater connectors; Lynchburg (Va.) Foundry Co.—cast-iron pressure pipe and fittings.

Steamway Products Inc., Cleveland—relief valves; D. Talarico Reg'd, Montreal, Quebec—forced air furnaces; and Western Gas Engineering & Equipment Ltd., Vancouver, B.C.—gas conversion burners and development of industrial gas equipment.

GAS association notes

William E. Hoare, employee relations director of Ohio Fuel Gas Co., Columbus, has been elected chairman of the American Gas Association Great Lakes personnel conference for 1956-57. Other officers are Emory A. Manlove, assistant vice president of Peoples Gas Light & Coke Co., vice chairman, and Ray Antolik, industrial relations manager of East Ohio Gas Co., Cleveland, secretary.

New chairman of members of the AGA's control househeating approval requirements committee is K. H. Flint, manager of Perma-glas heating and air conditioning engineering for the A. O. Smith Corp., Kankakee, Ill.

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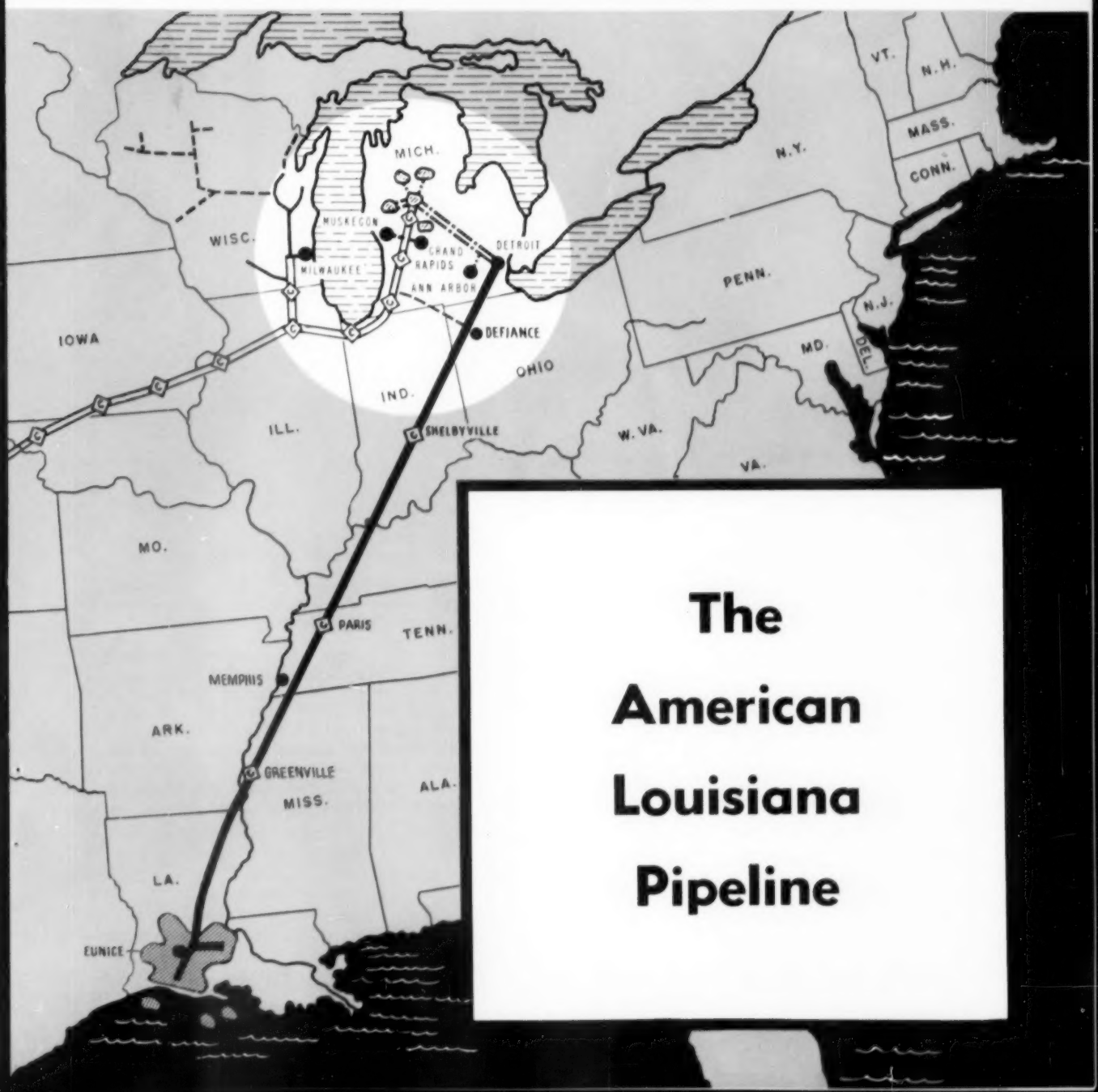
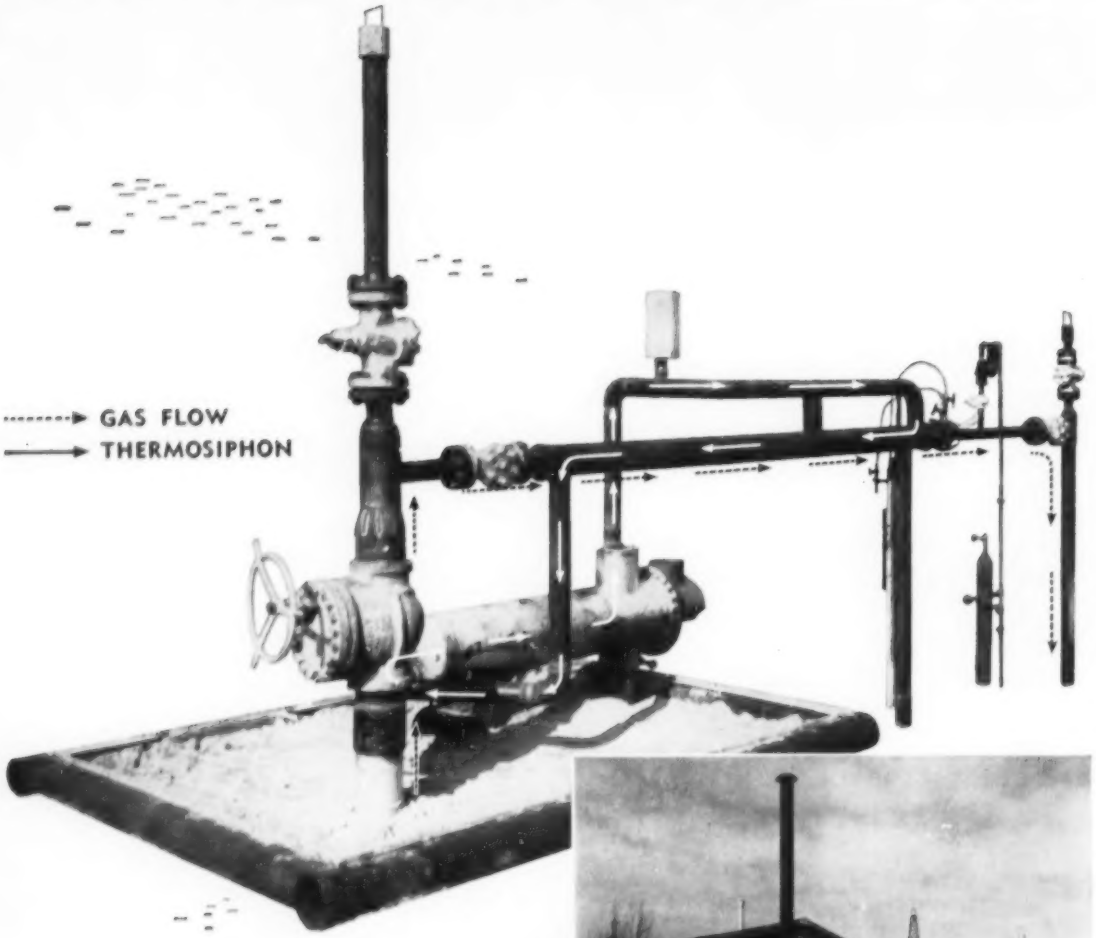
GAS

PIPELINE SECTION

ENGINEERING • CONSTRUCTION • MAINTENANCE



The American Louisiana Pipeline



GAS UTILITY USES 225 NATIONAL HEATERS... SAVES $900 PER MONTH

SITUATION — Underground natural gas storage area in Central Michigan underlying 25 sections of land. Input pressures range from 307 # psi to 700 # psi. Gas is dehydrated before storage.

PROBLEM — To find a heater

1. That would give a 35 degree temperature rise to a gas stream whose maximum flow would be 500,000 cu/ft. per day.
2. That was small enough to fit in a small house covering both the wellhead and the heater.
3. That would operate at maximum efficiency since all gas consumed in the heater cost approximately 30 cents per thousand cu/ft. at the wellhead.

RESEARCH — Several types of "home-made" and commercial heaters were tried along with National's 16" x 6', Model CA124 Horizontal Heater.

RESULTS — By actual fuel consumption tests, using identical hook-ups, National's heater outperformed all others using exactly one half as much fuel as the competitive models. The gas utility shows a savings of $900.00 per month, based on a 12-month gas expense period. These savings are based on actual tests. They are effected by using 225 National 16" x 6' direct heaters — indirectly — in this one area.

It's National

NATIONAL TANK COMPANY

American Louisiana's "EXPANDING INCH"

Men and equipment were congealed into a team that defeated weather and terrain across eight states as the American Louisiana pipeline was built to bring natural gas from the shores of the Gulf of Mexico to the shores of the Great Lakes.

By J. FRED EBDON, Editor

ADEQUATE natural gas service to the utilities in Michigan, Wisconsin, Iowa, and Missouri is the sole purpose for the new 1000-mile, 30-in., American-Louisiana natural gas pipeline. Like several other recent pipeline projects, the growth in the market has resulted in plans to expand the system prior to the actual completion. Between $130 and $140 million in capital will be spent before the system is fully installed. It is a measurable example of the effort made to further improve gas service to consumers. These monies are from private sources; the project is a sharp example of private industry supplying energy to the nation without government participation.

The American Louisiana pipeline is, basically, 1000 miles of 30-in. OD, solid-welded steel piping from near Eunice, La., to Willow Run, Mich. Sales laterals, connecting pipelines and gathering lines of smaller diameter, will aggregate over 1200 miles of connected pipeline.

As originally certificated by Federal Power Commission on Oct. 1, 1955, the capacity of the American Louisiana system was 109 billion cubic feet of natural gas a year, or 300 MMcf/day. The cost of the line was estimated at $130 million; however, the system and development program—drilling of new gas wells; building gathering lines; the expansion of connected, and construction of new, distribution systems, and the sales of gas appliances to existing and new consumers—will result in an estimated

GAS staff report

total expenditure of $500 million.

The initial capacity of the pipeline was designed to permit 16 utility companies to connect an additional 375,000 space heating customers. It doubled the natural gas supply to Wisconsin distribution companies, and enabled them to start on a program for expansion of their basic service to meet the full requirements of customers. It makes gas service available to 23 communities that lacked natural gas supply.

On May 14, 1956, American Louisiana came before the FPC with a proposal to expand the nearing-completion pipeline system to enable it to increase daily capacity by 100 MMcf, to 400 MMcf. This proposal, as in the case of the original construction authorized, is for the purpose of alleviating "a crying demand for additional quantities of natural gas in the Michigan-Wisconsin area."

The first phase of the expansion plans was temporarily authorized by FPC order dated Aug. 8, 1956. Work is going forward on the installation of two new 12,000 hp compressor stations and the addition of 2000 hp at each of two initially constructed stations. The entire 60 MMcf/day will go to Michigan Wisconsin Pipe Line Co. until Dec. 31, 1956, and, thereafter, 55 per cent of the intial increased volumes are to be delivered to Michigan Wisconsin and 45 per cent to Michigan Consolidated Gas Co.

Gas supply

American Louisiana Pipe Line Corp. is drawing on the huge natural gas reserves of the prolific Gulf Coast. The major purchases will be from the Superior Oil Co., the Stanolind Oil & Gas Co., the British American Oil Producing Co., and Kerr-McGee Oil Industries, Inc. All operate in the southern Louisiana fields. Gulf Oil Corp. will bring gas in from its Krotz Springs, La., field.

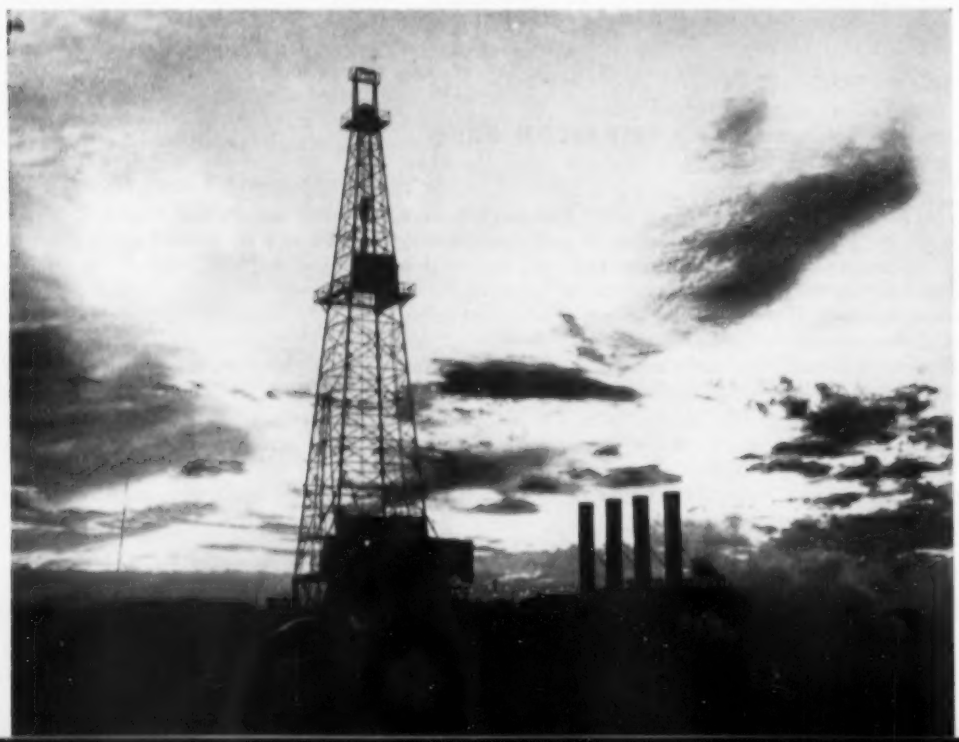
Gas supply plans even invade the producing frontier of the offshore fields in the Gulf of Mexico. In addition, American Louisiana is purchasing 50 MMcf/day from Texas Gas Transmission Corp. (Owensboro, Ky.) at a point of connection near Slaughters, Ky., and Texas Gas appeared before FPC on July 19, 1956, to file application for certification to make deliveries to the American Louisiana line in southern Louisiana. Delivery volume from four fields, as proposed, is 32.6 MMcf/day.

Total reserves dedicated, at certification, to American Louisiana by the several producing companies were 2.5 trillion cubic feet. This volume was adequate to feed the system at certificated capacity for a period of more than 20 years. The contract with Texas Gas Transmission called for 18.6 billion cubic feet a year, also for 20 years.

With a 20-year firm gas supply assured, American Louisiana was in good position to serve the affiliated gas companies, and indirectly, the latters' customers with volumes for all their needs. But, the gas supply efforts and results did not stop there.

While the 30-in. pipeline was under construction, more recent surveys of the gas markets existing in the service areas of Michigan Consolidated and Michigan-Wisconsin indicated that even the certificated capacity of the American Louisiana system would not make sufficient volumes of natural gas available to supply the existing increase in demand and permit additional service in relation to the expected normal growth of the loads. Recognizing responsibilities to serve these markets, American Louisiana increased gas reserves by more than 40 per cent while building the pipeline at the same time.

There is no reason to assume that these are the last developments relating to gas supply. Probably, as this literature is being published, you will hear of additional gas reserve agreements and plans to assure American Louisiana's customers of reliable, ever increasing natural gas supply.



You can "spit into the Gulf of Mexico" from this rig's location as sunset catches it drilling away under American Louisiana's gas reserves program.

Route of the pipeline

One might say that American Louisiana system starts several miles out from the mean tide mark on the drab sands of the Louisiana Gulf Coast, where the usually placid salt waters of the Gulf of Mexico lazily slap against the steel pilings of drilling platforms located at optimistic positions on the very gentle slope of the Gulf continental shelf. From such platforms, casing is set deep into the crust of the earth to a depth of 12,000 ft., just for example, and completed into a producing stratum at that minus elevation. From the same platform, other wells have been drilled and even now another well is being drilled as the rotating bit bites the formations that once were coastal plains during former geological eras.

Shoreward, such fields as Cameron, South Jennings, Iowa, Welsh, the North and South Eltons, all in the boiled-catfish-and-rice belt of Louisiana, are connected with the pipeline by various diameter gathering laterals. This is the country of the shaggy moss-fringed bayous, the water hyacinth, the semi-tropical lushness that spells both beauty and rough pipelining. A few miles north, the Savoy, Bayou Mallet, Lewisberg, and Krotz Springs fields are tied-in by the Krotz Springs gathering line. This is in the picturesque and valuable rice growing section of Louisiana.

The Krotz Springs line joins the system at North Tepetate (near Eunice, La.) where a major measuring station has been constructed. The 30-in. segment of the pipeline system originates at the North Tepetate metering station and extends about 1000 miles in the generally northward direction.

From North Tepetate, the 30-in. pipeline cuts on through miles of the Louisiana rice producing land to cross the Red river near Alexandria, La., and the Ouachita River before cutting through the southeast tip of Arkansas. On leaving the plains of Arkansas the line makes an underwater passage of the Mississippi near the quiet town of Greenville, Miss. The first compressor facility on the long gas-carrying conduit is located nearby.

Route of American Louisiana's "Expanding Inch."

The pipeline enters Tennessee southeast of Memphis, passes close to Paris, Tenn., where the second compressor station (#6) has been constructed, and continues to the next major obstacle (Kentucky Lake reservoir of the Tennessee River) after crossing the Kentucky state line at a point about 8 miles north of Paris. The country along this part of the line is the beautiful, dogwood studded hills of Tennessee and Kentucky—where really rural America is still fighting a losing battle against suburban encroachment and where rumor has it that certain rustic entrepreneurs continue to bring off enamel dissolving distillation.

The Cumberland River is crossed and left behind as the line continues northward to a connection with Texas Gas Transmission's pipeline at Slaughters, Ky. Reaching ever northward, the piping makes a crossing at the Green River and then the Ohio River, west of Owensboro, Ky., crossing the line into Indiana. From there, the line is installed under the East Fork of the White River, below Bloomington, and the third compressor station (#9) was built west of Shelbyville, Ind. Moving on into Ohio, the line runs east of Decatur, Ind., and at Reliance, Ohio, a lateral to Michigan-Wisconsin Pipe Line takes off after the mainline crosses under the Maumee River.

Michigan is entered near Fairfield Township and the steel tube then cuts to the west of Blissfield and Milan before crossing Ford Lake and the Willow Run expressway. There, the line turns east and continues to the Willow Run metering station near the intersection of Michigan Avenue and the Ypsilanti by-pass.

Between the North Tepetate and Willow Run metering stations lies approximately a thousand miles of 30-in. steel piping that represents many hours of human endeavor, millions of dollars invested by the public, and the source of new energy for a variety of applications in one of the prime industrial centers of the United States.

The pipeline design

All piping, stations and components are designed to equal or exceed the gas industry's new Code. Standardization plays a big part in making American Louisiana's line easy to operate and, at the same time, provides assurance for maximum continuity of service.

THE Gulf-to-the-Great Lakes pipeline of the American Louisiana Pipe Line Corp. was designed to comply with the Code for Pressure Piping, American Standards Association B31.1.8—1955, and revisions thereto. Design was the responsibility of Ford, Bacon & Davis, Inc., New York, along with American Louisiana engineers. Ford, Bacon & Davis is a firm that has had outstanding experience in the design of long, natural gas pipelines and many other facilities in the natural gas industry. The Ford, Bacon & Davis Flow Formula for Design of Pipe Lines was used for preparing flow diagrams reflecting average and peak day delivery capacities of the initial installation based on 1958 maximum day loads:

$$Q = 840\ E\ M\ N\ D^{2.66}\left(\frac{P_1^2 - P_2^2}{L}\right)^{0.555}$$

Where:
Q = Flow, in ft³/day
E = Line flow efficiency (94%)
M = Measurement base adjustment factor

$$M = \left(\frac{14.735}{P_b}\right)\left(\frac{T_b}{520}\right)$$

P_b = Base pressure, in psia
T_b = Base temperature, in °F absolute
N = Gas characteristic adjustment factor

$$N = B^{0.03}\left(\frac{0.6}{G}\right)^{0.46}\left(\frac{7.0}{Z}\right)^{0.08}\left(\frac{520}{T}\right)^{0.54}$$

B = 1 + deviation from Boyle's Law @ avg. pressure
G = Specific gravity (air = 1)
Z = Viscosity, in English absolute units x 10^6
T = Flowing temperature, in °F absolute
D = ID of pipe, in inches
P_1 = Line input pressure, in psia
P_2 = Line output pressure, in psia
L = Length of pipeline, in miles

The main segment of the pipeline was designed to be 972 miles of 30-in. OD, solid-welded steel pipe extending from Mile Post O, at the outlet of the master measuring station at North Tepetate, La., to Mile Post 972 at the outlet of American Louisiana's Willow Run measuring station and the inlet of the receiving and pressure regulation facility built there by Michigan Consolidated Gas Co. Auxiliary lines for laterals and gathering were specified as 24-, 22-, 12.75-, 8.625-, and 6.625-in. OD depending on the location and service.

The maximum allowable operating pressure is 858 psig; however, average operating pressures for maximum day deliveries will be about 858 psig out of the North Tepetate master measuring station and 523 psig into the Michigan Consolidated receiving and pressure regulating installation on the outlet of the Willow Run measuring station. The first compressor station (No. 3) is at Mile Post 234, the second (No. 6) 243 miles downstream at MP 477, and the third (N. 9) 252 miles further on.

The average gas volumes these facilities will handle are shown in *Table 1*.

Full opening gate valves were used at block valve installations and were installed at spacings in compliance with the Code. Scraper traps were installed at each major metering point, compressor station and river crossing. All river crossings were made underwater.

The entire pipeline was designed to permit ease in operation while at the same time providing assurance of maximum continuity of service. The design program stressed simplicity and security—it is a pipeline that can be operated from the start with maximum effectiveness.

TABLE 1. AVERAGE GAS VOLUMES HANDLED DAILY.

Field purchases	306.7 MMcf @ 14.73 psia & 60°F.
Fuel	3.7 MMcf @ 14.73 psia & 60°F.
Estimated loss	3.0 MMcf @ 14.73 psia & 60°F.
Deliveries	300.0 MMcf @ 14.73 psia & 60°F.

TABLE 2. PROPERTIES OF PIPE IN AMERICAN LOUISIANA SYSTEM.

Outside Diameter (inches)	Wall Thickness (inches)	Specifications	Specified Minimum Yield, (psi)	Ultimate Tensile Strength (psi)	Method of Fabrication
24.00	0.344	API 5LX-52	52,000	72,000	Electric welded
22.00	0.250	API 5LX-52	52,000	72,000	Electric welded
12.75	0.250	API 5LX-42	42,000	60,000	Electric welded
8.625	0.250	API 5L Grade B	35,000	60,000	Seamless
6.625	0.250	API 5L Grade B	35,000	60,000	Seamless

The pipe

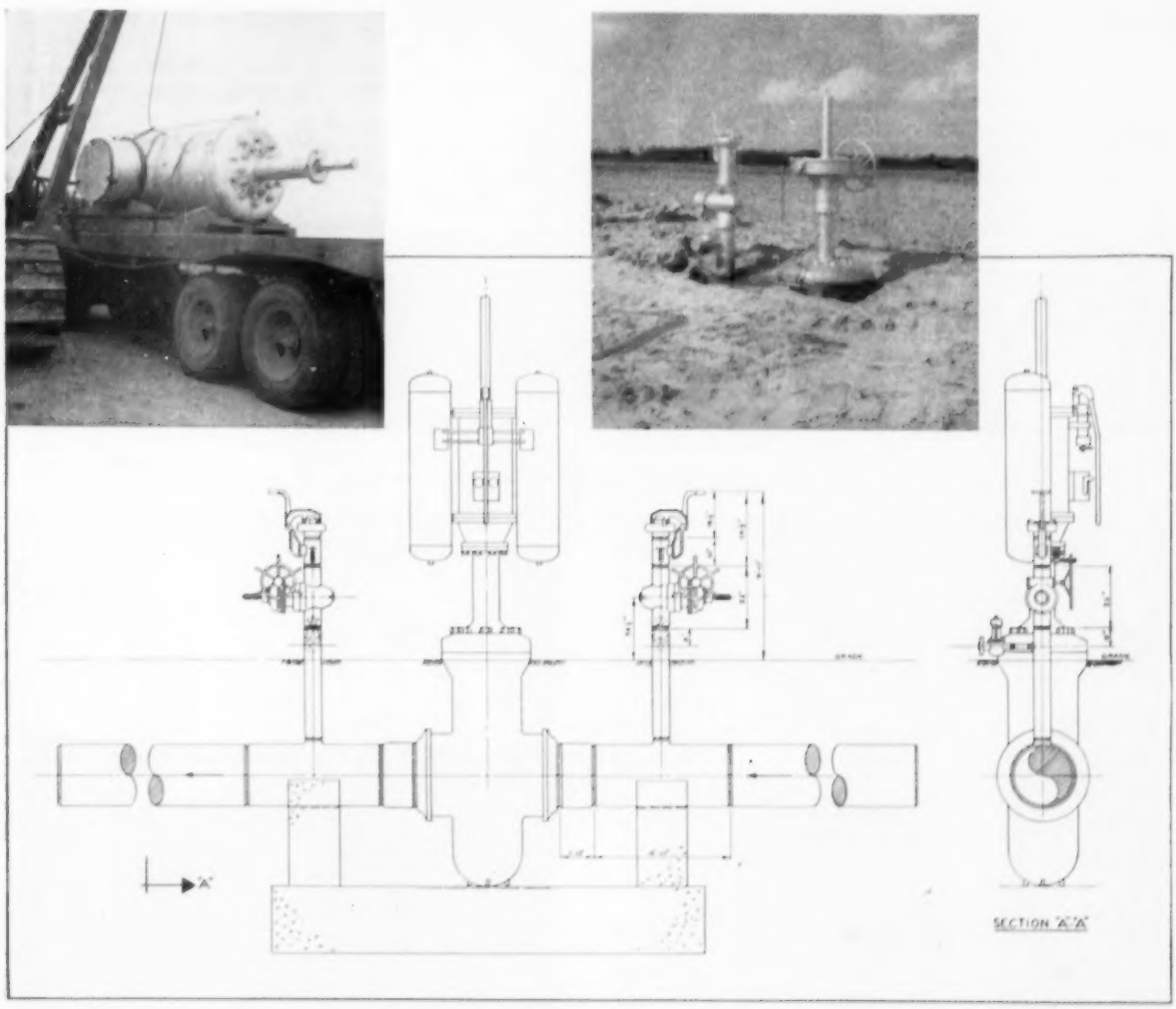
The basic pipe used in the 972-mile, 30-in. segment of the main line is 30.00-in. OD, API 5LX-52, line pipe with a 0.312-in. wall thickness. The minimum specified yield strength is 52,000 psi, and the ultimate tensile strength is 72,000 psi. The pipe was fabricated by the electric welded process. Properties for other pipe used in the system are shown in *Table 2*.

Other pipe sizes were used as required for special applications; however, in every case, the minimum wall thickness of each pipe diameter is equal to, or greater than, that specified for the indicated maximum allowable operating pressure in accordance with the ASA B31.1.8-1955 Code. All fittings were specified as ASA series 600 for a maximum non-shock, WOG service pressure of 1200 psig or greater. Fittings welded are Grade B material with a specified minimum yield of 35,000 psi.

Over 758 miles of the 30-in. pipe was fabricated in the Houston mill of the A. O. Smith Co. of Texas. This company originally received the contract to roll the pipe for the entire 30-in. segment, but conditions beyond its control prevented fulfillment of the contract. At that time, the American Louisiana contract was the largest single order for line pipe ever placed.

Pipe producers quickly came to the aid of the pipeline company when a pipe shortage seemed imminent. Lone Star Steel Co. (Dallas); National Tube Division of United States Steel Corp. (Pittsburgh); Republic Steel Corp. (Cleveland); and Youngstown Sheet & Tube Co. (Youngstown), cooperated in the situation and supplied pipe, in various diameters, on short notice from stock, special runs, and stepped up production. Several of the companies helped American Louisiana to arrange trade-outs with customers whose line pipe requirements were not as immediate. It speaks well of the tubular products divisions of the steel companies to note that they made every effort to accommodate American Louisiana for the betterment of that pipeline and the gas industry.

Mill inspection of both the plate and the pipe was carried out by



Standard block valve assembly.

independent inspection laboratories. Mill test pressure was 1170 psig to produce a hoop stress to 90% of the minimum yield.

American Louisiana inspectors were tight in their control of gouges, grooves and notches in the pipe. Their philosophy was that experience has shown these factors to be important causes of pipeline failures in the past, and you might as well eliminate a damaged section of pipe as strung rather than let it go and cut it out later after trouble made any defects known. The spread men cooperated all the way with this policy. Field repair of gouges and grooves was held to an absolute minimum.

Block valve assemblies

Seventy-six mainline block valves were installed in the 30-in. portion of the pipeline. All of these were W-K-M Through-Conduit gate valves in the ASA Series 600 class. The block valves were specified with welding ends and were solid welded into the line, with transition pieces tieing-in with 30-in. x 10-in. x 30-in. extruded outlet blowoff fittings on both the upstream and downstream side of the valve.

Each main line valve was ordered equipped for installation of a Shafer gas valve operator which is used to close the gate valve automatically on indication of a pressure differential in the range of break in the piping.

Block valve locations were selected in accordance with spacings as specified in the ASA Code and in every case were located adjacent to roads where they will be directly accessible for service and inspection. Spacings range from 5 to 20 miles.

Blow-down stacks were fabricated from 10-in. ND, 0.344-in. wall, Grade B, seamless line pipe and were fitted with gear operated, Walworth, welding-end, lubricated plug valves. Quick opening blow-off assemblies are used throughout.

The block valve assemblies do not have by-passes as the frequency of scraper traps is such that they are not needed.

Fabrication of the assemblies was done in the field at the time of heavy construction. The 30-in. gate valves weigh 26,000 lb and provided some interesting moments on the spreads. Valves were flatbedded to close by the block location. Then, it took a heavy crawler with a large capacity side boom pipelayer to pick up the huge bulk and walk away with it.

Cover at the block valve locations was specified as not less than 30-in. and not more than 42 in. Concrete piers under each blow-down stack were poured after the valve assemblies were set. Piers were designed to produce reaction forces to resist downward force vector of the jet effect when the stacks are wide open under maximum allowable operating pressure. The piers rest on a reinforced concrete pad that provides foundation for the body of the 30-in. gate valves and has footing carried down to undisturbed soil.

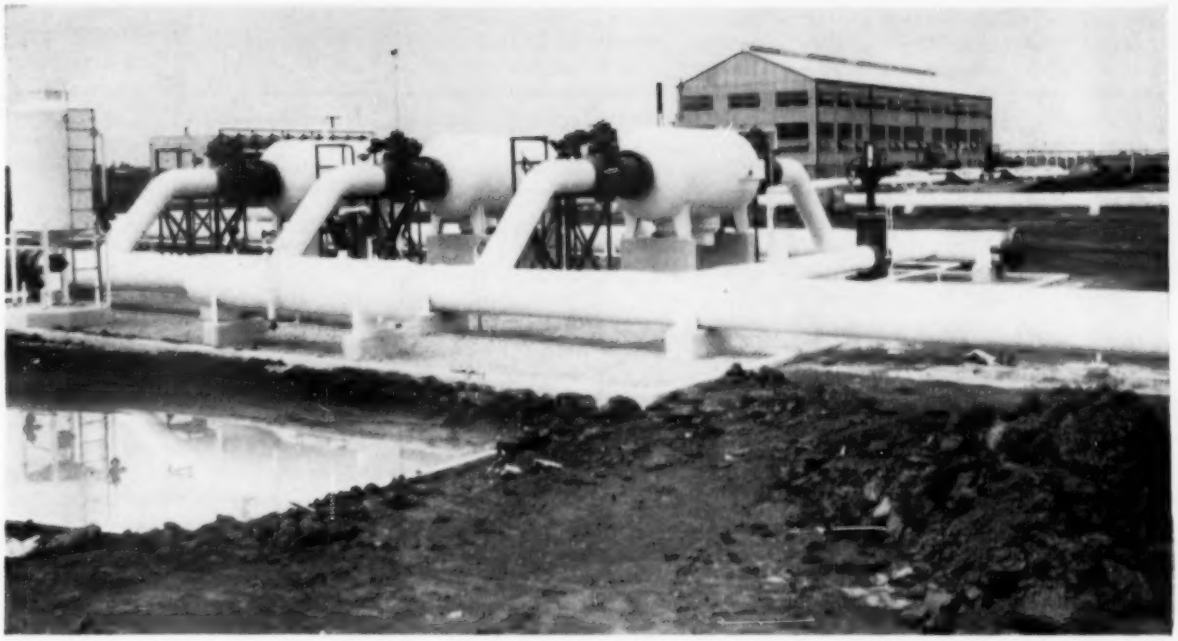
Scraper traps

The designers of the pipeline made provisions for the installation of pig traps at each major metering station, river crossing, active compressor station, and proposed or future compressor station location. The design is straightforward.

The receiver and launcher barrels are 32-in. diameter and are spaced 16 ft apart. Muzzle of the receiver and breech of the launcher are fitted with scraper trap closures. End bleed-offs are 4-in. diameter with a Walworth WEFE plug valve under a 4-in. blow-off assembly. Mainline trap valves are 30-in. W-K-M gear operated gate valves, with a 10-in. blow-down stack toward the barrel end of each.

Scraper trap by-pass lines are 26-in. x 0.500-in. wall piping and serve as station by-passes at compressor station locations. By-pass lines have a 2-in. x 24-in. Walworth, WE, gear operated plug

Scraper trap at North Tepetate master measurement station during construction and at completion.



Overall view of Compressor Station 3, Greenville, Miss. Horizontal scrubbers, with oil reservoir and settling tanks, are seen in foreground.

valve. Recovery tubes are not specified.

Equalizer and kicker lines are 10.75-in. OD seamless line pipe with 0.365-in. wall thickness. These feed from 26-in. OD x 0.500-in. wall line pipe side gate runs. (The 30-in. mainline suction and discharge piping design also calls for 0.500-in. wall thickness.) The equalizer and kicker lines are controlled by 10-in. Walworth WE, plug valves normally locked in the open position.

The 26-in. station sidegate valves and the 10-in. blow-down stack valves are equipped with Shafer valve operators and tied-in for emergency shutdown actuation with the compressor station.

Compressor stations

Three compressor stations were constructed under American Louisiana's initial construction program. All stations were designed and constructed by Brown and Root of Houston. Soon, the line's expansion of capacity will be accomplished in two steps. The expansion program will involve additional horsepower in existing stations and additional stations.

The currently operating compressor stations are each rated at 10,000 hp. In addition, there is a 440 hp J. B. Beaird Co., Inc. (Shreveport), packaged compressor installed at the North Tepetate master measuring station to boost the pressure of the gas from the Texas Gas lateral line to mainline pressure.

The first mainline compressor facility is located about 234 miles toward Detroit from North Tepetate, at Greenville, Miss., and is designated Station No. 3. The next compressor station is designated No. 6 and is 243 miles down the line at Paris, Tenn. Gas is compressed in a final stage at Station No. 9, located at Shelbyville, Ind., 252 miles from Station No. 6. From there, 200 MMcf/day flows into the Willow Run metering station some 275 miles down the line and another 100 MMcf/day takes off from the mainline at a point (near Defiance, Ohio) 151 miles from Station 9. The latter gas is delivered to Michigan Wisconsin Pipe Line Co. at its compressor station, Michigan A, some 120 miles away from the take off point on the American Louisiana mainline.

As previously mentioned, each of the stations have engines installed to produce 10,000 hp and the station design is exactly alike. However, different engines are used at each station. All compressor units are reciprocating.

The engine compressor units used on the American Louisiana pipeline are as follows:

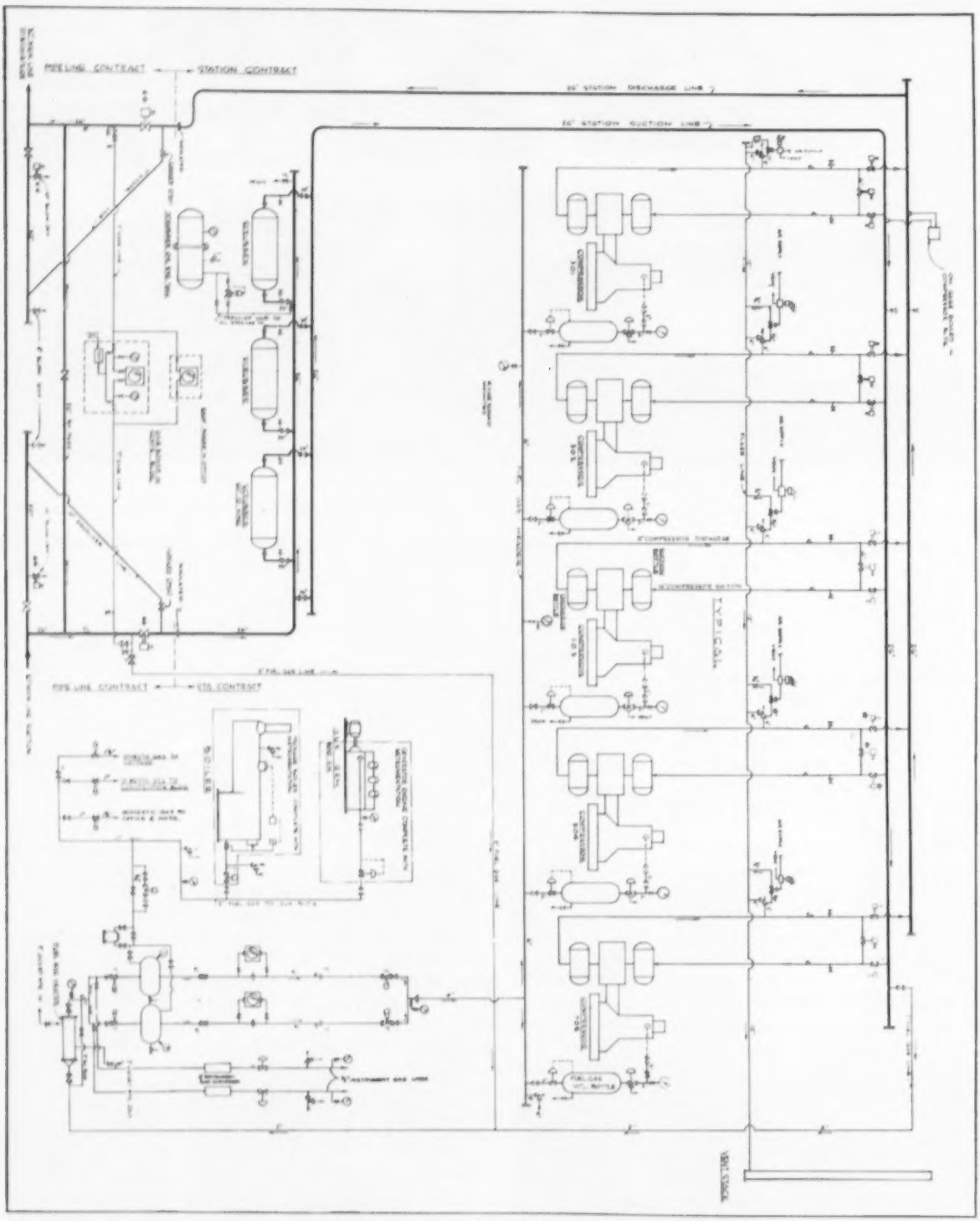
Station 3—Greenville, Miss.—five 2000 hp Clark TLA turbocharged.

Station 6 — Paris, Tenn. — five 2000 hp Cooper-Bessemer GMW-A.

Station 9—Shelbyville, Ind.—five 2000 hp Ingersoll Rand KVS turbocharged.

Ignition for all of these engines is accomplished with pulse generators.

Gas enters a compressor station via a 26-in. inlet sidegate from the 30-in. mainline. Piping in the station is 26-in. OD with 0.625 in. wall thickness. Suction side gas passes to a bank of three King horizontal scrubbers installed in parallel. These scrubbers utilize a fractional-horsepower electric motor to drive a rotating disc or propeller that is partially submerged in the scrubber's oil reservoir as a revolution is made. The oil-wetted surfaces of the propeller produce surface tension adequate to scrub even minute solid particles from the gas stream that is passed through the unit. Sight glass manometers show the differential through each scrubber and the loads are balanced by pinching inlet valves to adjust the three differentials, each for a respective scrubber, to equality. The



Flow diagram for the three compressor stations initially constructed.

King scrubbers are 60-in. ID and have 20-in. OD inlet and outlet piping from 36-in. OD headers. A 16-in. OD by-pass line joins the scrubber inlet and outlet headers. A scrubber oil storage tank and a settling tank are located adjacent to the scrubber bank.

From the scrubber outlet header the clean gas flows to the 26-in. OD compressor inlet header and to the suction bottles through 16-in. compressor suction lines controlled by valves with automatic operators actuated by push buttons on a control panel near each engine. The gas is compressed, passes to the discharge bottles, to the compressor discharge header, through a Fluor pulsation dampener, and into the 30-in. main line via the station discharge sidegate. It should be emphasized that this flow description, as well as other descriptions, is applicable to all three compressor stations as they all are designed exactly alike to facilitate ease in operation and training.

The exhaust stack of each compressor engine is fitted with Maxim silencers made by the Maxim Silencer Co. (Hartford). These units are mounted horizontally with outlet stacks elbowed up 90° to vertical.

Engine air supply lines are equipped with American air filters from the American Air Filter Co. (Louisville). The air cleaning equipment is vertically mounted outdoors, and an in-line silencer is provided just downstream from the filter. Such units increase effective horsepower and are designed for compactness, and operation with low pressure drop through the device.

Cooling water for the engine jacket cooling water system and oil coolers is taken from two wells at each of the three stations. For illustration, the wells at Station 6, Paris, Tenn., are each 290-ft. deep and are pumped at 100 gpm. Zeolite softeners are used for water treatment and have their salt bin located in a concrete pit in an auxiliary building.

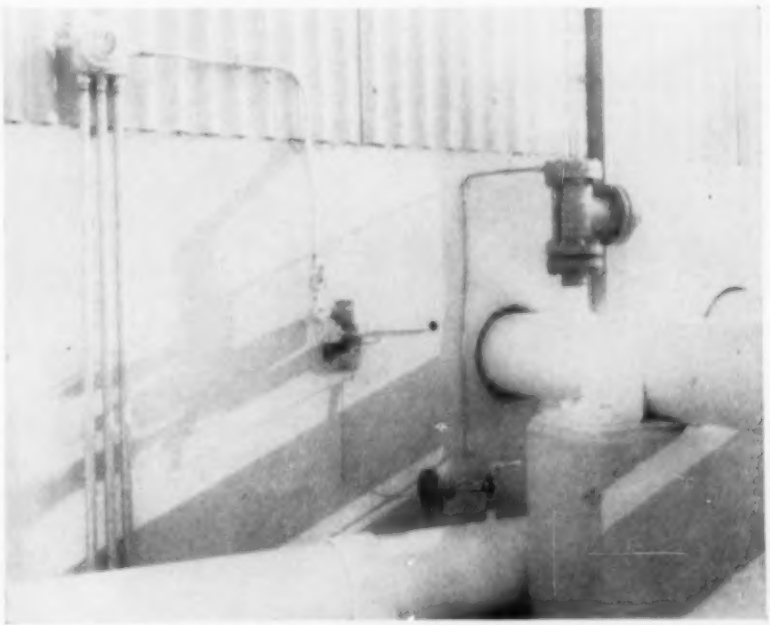
The jacket cooling water is circulated in a closed system. Each engine has an integral water pump. The water loses its heat in five, fin-fan type, air cooled heat exchangers supplied by Griscom-Russell Co. (Massillon, Ohio). The fans on these cooling units are motor driven. Louvers on the "fin-fan" coolers are opened and closed automatically in relation to the need to heat or cool jacket water, as sensed and actuated by the temperature controller.

Cooling water for the lube oil coolers is taken as a sidestream from the jacket cooling water system. Here, temperature control is accomplished by diverting more or less flow through the lube oil coolers. The engines have integral oil pumps and use McCord lubricators. Commercial Fulflo oil filters are in the lube oil system to scavenge the flowing fluid.

The fuel gas system is tapped into the station inlet sidegate line ahead of the suction sidegate valve. Fuel line is 2-in. pipe and is tied in with similar 2-in. piping that is tapped into the downstream end of the compressor suction header. Then, a common line conveys the fuel gas to a fuel gas heater. This heat exchanger takes a side stream from the jacket cooling water system on the hot side. From there, the fuel gas headers into twin runs equipped with Fisher No. 667-D pressure control valves that limit the fuel gas pressure to 150 psig. Then, two surge tanks are passed through and the fuel gas is metered in dual, parallel, 4-in. orifice meter runs where measurement data are recorded with American "Metric" A-88 differential and static pressure recorders. The orifice plates are held by Daniel orifice fittings. The twin lines swage down to 2-in. and the fuel gas pressure takes a second reduction at twin Fisher No. 657-AR pressure control valves that cut the pressure to 75 psig. A 4-in. line takes off from a 2-in. header and moves the fuel gas to a 6-in. fuel gas header.

Individual fuel gas piping to the five engines is 2-in. into fuel gas volume bottles. Prior to entering the bottles, pressure control valves reduce the pressure to an engine utilization value of 50 psig. Lines out of the volume bottles to the engines are 3-in. Fulton Sylphon compressor fuel shut off and vent systems are installed in each fuel line just downstream from the volume bottles.

Dual 0.50-in. instrument gas lines take off from the engine fuel gas lines at the meter run header. Instrument gas passes through two small scrubbers, has its pressure reduced by parallel Fisher "Big Joe" No. 630 pressure regulators, and passes on to the instrument and control piping system.



Solenoid valve (on wall), miniature motor valve, and relief valve are integrated into a three function—relief, purge, and emergency blowdown—system, push button operated from several points within the compressor stations.

Other auxiliary fuel gas lines tap the fuel gas system at the surge bottles ahead of the meter runs. They convey the fuel to a Rockwell No. 3 positive displacement meter for measurement. Then, auxiliary gas flows to a regulator station where a 1-in. Fisher "Big Joe" reduces the gas pressure to 25 psig. The 2-in. auxiliary fuel supply line then branches; one leg goes to the packaged boiler and the emergency engine-generator unit, and the other headers into three lines that serve domestic gas to (1) office and warehouse, (2) construction building, and (3) to the company cottage.

The starting air system will provide engine starting air at 250 psig from three vertical tank-reservoirs. The vertical tanks were selected as they are designed to produce less condensation and, hence, there is less entrained moisture to the engines. Also, there is an air aftercooler on each of the compressors. This unit also contributes to knocking out moisture in the starting air system. All air compressors (there are two at each station) are Gardner-Denver Co., two-stage, 25-hp units. All are electric motor driven. Starting air is also used to power and actuate the emergency shut-off and blow-down system.

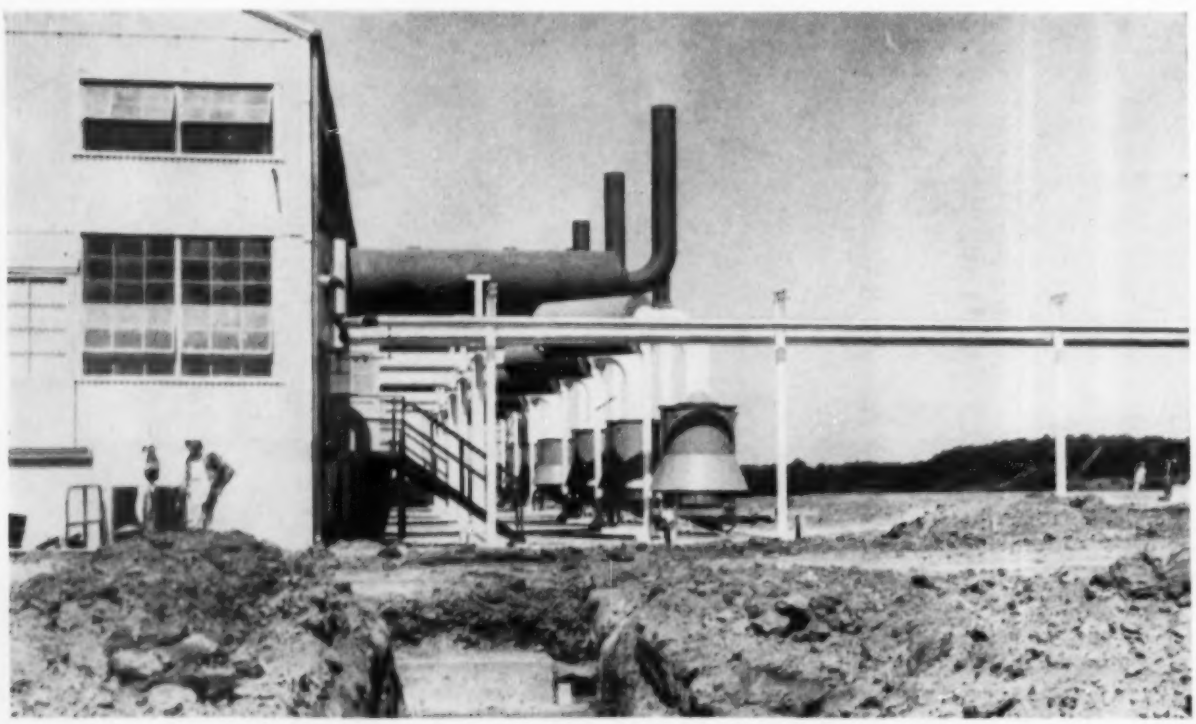
The emergency system installed at the American Louisiana compressor stations is semi-automatic and can be manually put into operation by actuating a lever at either of two locations. One actuating station is at the air tanks and the other is at the station entrance gate. Old pipeliners remark that the latter lever is actually at the leaving gate, as that would be the case if anything serious enough to warrant operating this unit occurred. In other words, "you'd flip the lever as you went by during your trip to quit the station."

Actuating either lever shuts down all engines and blows down the station. This is accomplished by the two Shafer operator equipped side gate valves closing and two 10-in. blow-down valves, also Shafer operator equipped, opening. The latter two blow-down assemblies are in the pig-trap runs.

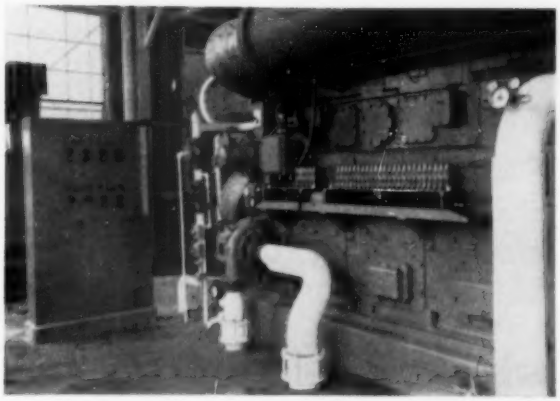
The core of the emergency blow-down systems at the American Louisiana compressor stations is a Garrett 3-in. x 4-in. relief valve installed at each engine. This valve is mounted on the discharge header and the outlet piping is tied into the flare line. A diaphragm operated Research Controls miniature motor valve is mounted horizontally on the flare line and connects to the bonnet of the Garrett relief valve through copper tubing. An ASCO control valve is mounted on the wall adjacent to each relief and blow-down setting to control pressure from the instrument air supply—bleeding it on or off the diaphragm of the motor valve at the will of the operator.

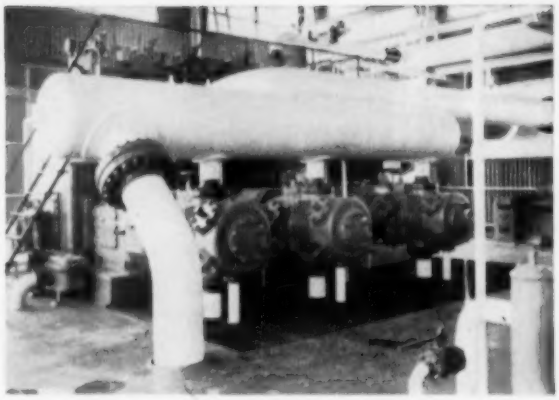
Three functions are served by the relief valve and control system. First, if there is a power failure and excess pressure is built up in the discharge header, the relief valve vents the excess pressure from the header.

Second, the Garrett relief valve serves as a purge valve. It is push button operated from remote locations by means of the solenoid valve. Pressure from the instrument air supply is admitted to the diaphragm of the spring closing, pressure opening motor valve. Pressure on the motor valve's diaphragm actuates it to vent the pressure off of the relief valve, to the



Views of a nearly completed compressor station on American Louisiana's line showing exhaust snubbers and air filters.





Each engine has a control panel board as shown in the view at left. Pushbuttons actuate functions. At right, the compressor side of a unit is shown.

flare line, allowing the plunger of the relief valve to rise. Thus, the discharge header is purged.

Third, the Garrett relief valve is used as a blow-off valve to release gas from the header in an emergency. This function is push button actuated from several locations. The same solenoid valve is used to control this function.

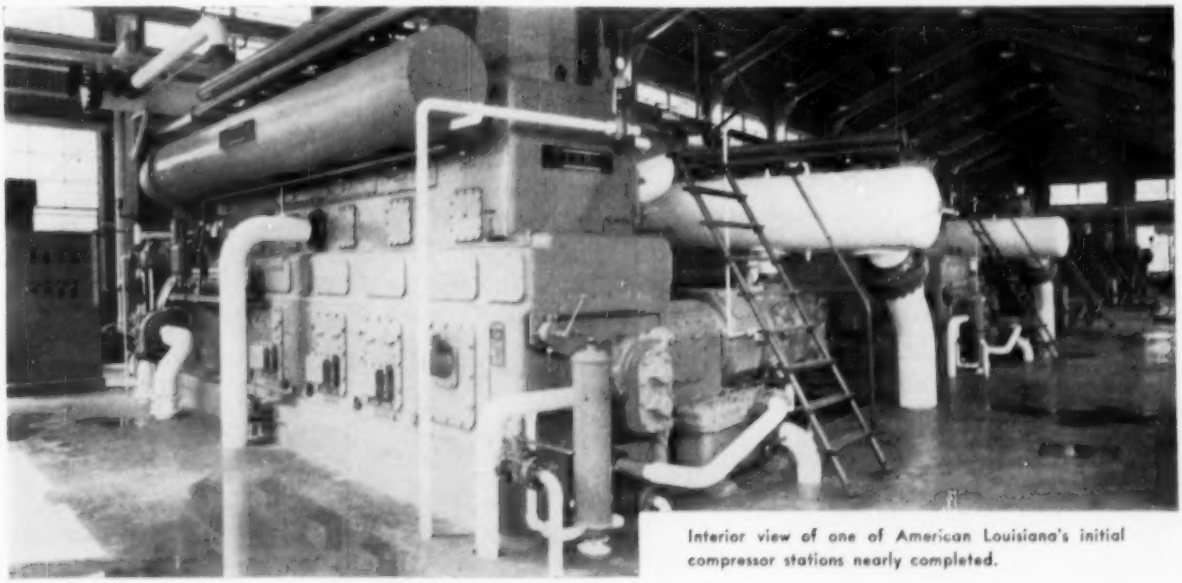
A ¼-in. needle valve is mounted in the bonnet of the Garrett relief valve and can be used to open it manually in the event of a power failure.

These blow-down and purge units, one at each engine, all feed into a common 12-in. flare line. The flare line extends outside the building to the vent stack.

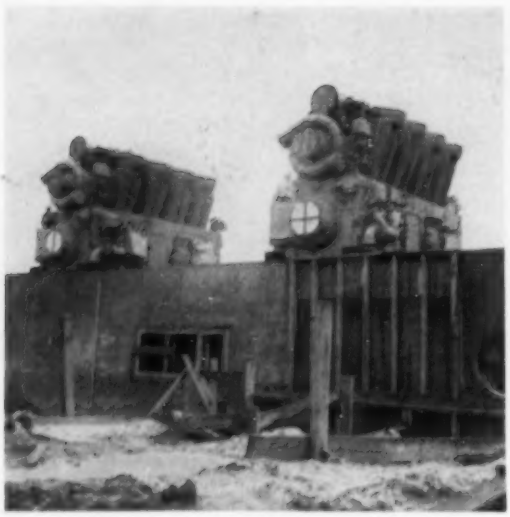
Other control systems in the compressor facilities are engine overspeed, engine overheat, and low oil pressure. These are rather conventional in design but are proven and reliable.

Electric power requirements for the American Louisiana stations are taken from existing public utility or TVA power lines. However, at each station there is a stand-by power generating unit ready for immediate action should the commercial power fail for any reason. The auxiliary generators are gas engine driven and are designed to be battery started automatically within nine seconds after a power failure. The engine-generator sets were furnished as a unit, complete with controls and instrumentation, by the Le Roi Division of Westinghouse Air Brake Co. (Milwaukee, Wis.). The unit produces 300 kw and is powered by a 12-cylinder, dual ignition (24 spark plugs), natural-gas-fired engine. The unit automatically drops off the load and shuts down when commercial power is again restored and is in permanent operation.

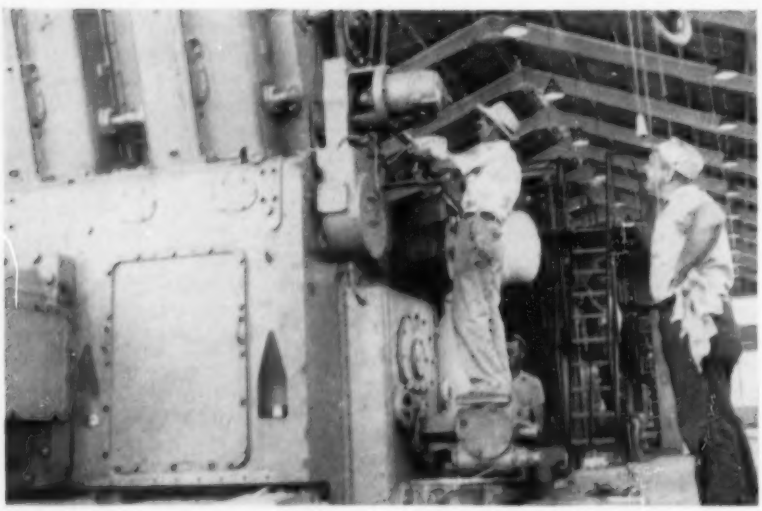
For station steam generation, there is a Cleaver Brooks (Milwaukee) packaged boiler at each



Interior view of one of American Louisiana's initial compressor stations nearly completed.



Wet weather slowed construction of compressor stations, too. Here, engines are set on their foundations at Station 6, Paris, Tenn., waiting for dry conditions.



Installation crews press the work of putting the compressor units in operating condition as the station nears completion.

Cleaning and maintenance on the compressor engines starts before the engines even go into service. Such routine work helps hold station efficiency after start-up.

station. These units were furnished with all necessary instrumentation and are gas fired.

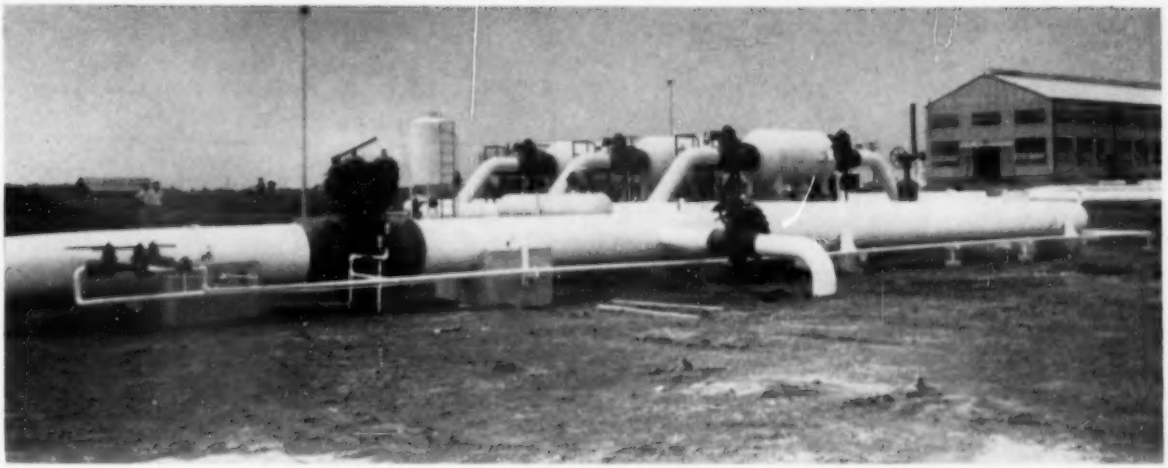
A machine shop is installed at each of the three initial compressor stations. These shops are completely equipped to make and repair material that can be reasonably handled in the field. Equipment installed includes a lathe, drill press, hydraulic press, power saw, and various other power equipment and tools. A tool crib, well stocked, is provided. In fact, the tools and equipment are available to perform any and all tasks required to maintain the engines and compressor units in efficient condition, as well as perform the usual periodic overhauls.

Each station has a complete warehouse where the many goods, parts, and equipment needed to keep this complex machinery in peak operating condition, can be efficiently stored. Warehousing, equipment, parts stock and inventory control are important, but often overlooked, parts of keeping a compressor station operating.

Large, modern washrooms are installed at the stations. These permit station personnel to change clothes in comfort and provide showers, etc., for the convenience of the crews. American Louisiana feels that station personnel spend a good part of their working day within the stations and they have designed all facilities with this concept in mind. They want satisfied crews and they have designed the compressor facilities to produce pride of association among the crews and to give them a clean, modern, comfortable place in which to work.

The stations are located on suitable paved access roads and the sites are selected so that each is near a town with desirable living conditions. Therefore, only one company cottage is provided at each station. The station superintendent and his family occupy this house. The remaining station personnel live in, or near, the adjacent town.

For the five engine stations, as initially installed on the American Louisiana pipeline, there is a complement of the station superintendent and 17 men. When the expansion plans are certificated and completed, there will be two com-



Suction sidegate at Station 3, Greenville, Miss. Note automatic sidegate valve.

pressor division superintendents; one will control five stations and the other will be responsible for six.

The superintendent of compressor stations is R. D. Milam. Field superintendent is W. R. "Bill" Clark. The station superintendents of the initial stations are: Station 3, Greenville, Miss., H. R. Jackson; Station 6, Paris, Tenn., Nate Beal, and Station 9, Shelbyville, Ind., W. L. Thompson.

These men are veterans in their art and have years of experience behind them in the compressor stations of the affiliated Michigan Wisconsin Pipe Line Co. Some of the key senior engineers at each station were also transferred from that company; however, many men, about 40 per cent of the crew at each station, were employed locally and are being trained under the guidance of the experienced compressor men.

The pipeline department will have separate facilities from the compressor crews. In other words, there will be no compressor station or pipe line department headquarters or crews on the same lot.

There are three large buildings and one company cottage at each compressor station. The main building that houses the compressors and related equipment and machinery is 43 ft x 15 ft; the auxiliary building measures 40 ft & 60 ft; and the office, warehouse, and garage building is 40 ft & 84 ft. These structures are steel rigid-frame, transite-sided buildings furnished by Metallic Buildings Inc. (Houston).

This is a view of a typical main compressor station building on the American Louisiana line.

The construction operations

OUR tour of the American Louisiana pipeline's construction phase started at Eunice, La. Five miles south and west from this now-thriving township, the master measuring station at North Tepetate marks the southernmost point on the 30-in. mainline.

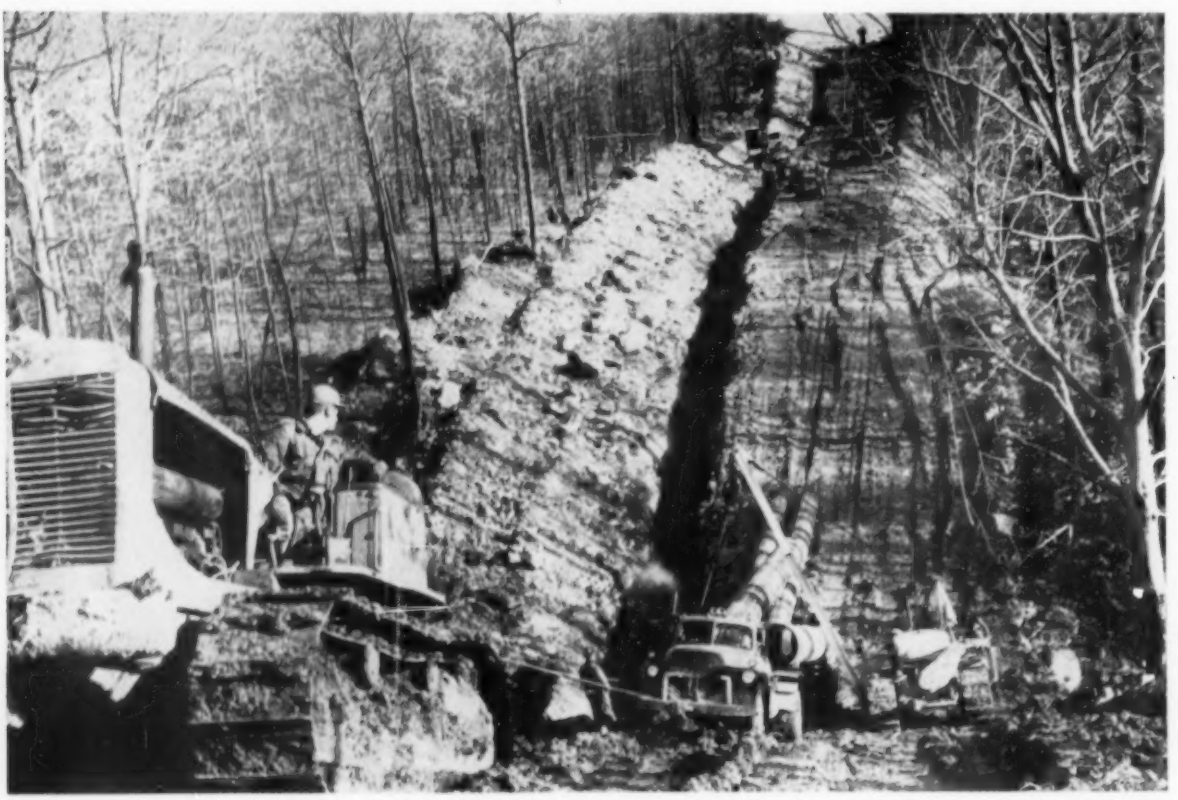
Gas from many southern Louisiana fields is gathered and transmitted to the mainline downstream from the North Tepetate meter station near Eunice. From this point, the gas is headed for Michigan and Wisconsin in the mainline. It is natural gas country.

The meter station block valves are equipped for automatic operation by Shafer valve operators. Inlet gas then passes to a battery of three King horizontal gas scrubbers installed in parallel. The field gas is then transmitted to the meter runs.

North Tepetate meter station has six parallel 12-in. meter runs equipped with 12-in. Daniel Senior orifice fittings from Daniel Orifice Fitting Co. (Houston). These fittings are WEFE and carry an ASA pressure rating of 600 psi, good for 1200 psig non-shock, WOG, operation. Three 12-in. Grove regulators hold the outlet pressure at 858 psig, on an average day.

A 440 hp J. B. Beaird compressor unit has been installed to boost the pressure of the Texas Gas line. A scraper trap is integrated with the sidegates of the meter station.

Full instrumentation for the determination of dew point, specific gravity and heating value of the gas have been installed. There is a dispatcher stationed at North Tepetate who can communicate with the Willow Run metering station and the Detroit offices via a three-circuit, leased wire line service supplied by American Telephone & Telegraph Co. The superintendent of dispatching, C. W. Sanders, maintains headquarters in Detroit.



American Louisiana's superintendent of measurement is Floyd S. Fisher, Detroit, and its superintendent at the North Tepetate metering installation is W. R. Broome. The district measurement engineer, Carl King, is also stationed there.

The meter runs, regulator bank, instrumentation and office spaces are functionally housed in an Armco steel rigid-frame, transite sided, prefabricated building. The station grounds are adequately graded and are protected by a chain-link fence. Valve stems are above ground for ease of operation. The valves equipped with Shafer operators utilize the type that enable them to be operated manually as well as automatically.

The station was designed by Joe Ross, measurement engineer with Ford, Bacon & Davis, Inc. (New York). He and his associates furnished general engineering supervision as well. The entire station was constructed by Ford, Bacon & Davis Construction Corp., headquartered at Monroe, La. This company also had contracts for some of the lateral lines that tie-in with the mainline system south of the North Tepetate master metering station. Their area forces were located at Eunice, La., during the construction phase.

The spread work

Pipeline construction is always a test of men and equipment. Some construction phases are rougher than others due to climatic and topographical characteristics of the routes. All, however, take their toll of men and equipment and none are what the average American worker would call easy.

From the south to the north, the contractors on the American Louisiana pipeline was as follows:

Brown & Root, Inc. (Houston), had the prime contract for construction of 16-in., 26-in., and 30-in. piping for the American Louisiana system within the State of Louisiana. They built 37 miles of underwater 16-in. themselves and subcontracted the remainder of the contract.

In addition, Brown & Root engineered and constructed the three compressor stations with which the line is initially powered.

Western Contractors (Austin) had 94 miles of 30-in. mainline in Louisiana from Brown & Root on a subcontract. This segment of the line extended from Eunice, La., to 10 miles north of Jena, La. The spread was headquartered at Eunice, La., and the superintendent was W. B. "Benny" Williams. The pipe crew started April 13, 1956, and had the project wound up by mid-August.

Associated Pipeline Contractors, Inc., (Houston) had the contract for the other 98 miles of 30-in. mainline in Louisiana under subcontract from Brown & Root. Their segment extended from north of Jena, La., to the Louisiana-Arkansas state line, near Eudora, Ark. The spread kicked-off on May 7 and made good progress through fairly good pipelining country. Superintendent E. D. "Emmett" Singleton had his spread office at Oak Grove, La., while we were in the field, but later moved it to Winsboro, La.

Houston Contracting Co. (Houston) in a joint venture with H. C. Price Co. had 770 odd miles of the 30-in. American Louisiana pipeline. In addition, they will construct the eastern 75-mile leg of a 121-mile extension of 22-in. pipeline from Defiance, Ohio, to Bridgman, Mich. One spread superintended by E. C. Norris worked out of Van Wert, Ohio, on 40 miles of 30-in. that had to be completed in Ohio when weather conditions permitted resumption of pipelining this year. This spread also constructed 21 miles of 24-in. from North Tepetate to Lewisburg in Louisiana.

Another spread with W. H. Hayes as superintendent, working from a base at Senatobia, Miss., constructed about 100 miles of pipeline for American Louisiana starting from east of Memphis and working south to join F. A. Silar's spread that built 85 miles of 30-in. working north from Eudora, Ark. The latter spread set up shop in Cleveland, Miss.

H. C. Price Co. (Bartlesville) had a joint project contract (with Houston Contracting) for over 770 miles of the 30-in mainline from near Eudora, Ark., on the Louisiana-Arkansas state line, to near Willow Run, Mich., in the vicinity of Detroit. Price put in over 185 miles of the contract in 1955; then, with the coming of spring "construction weather" this year, they put four of their five spreads on the American Louisiana line.

Spread 2, under R. L. "Bob" Ezell, had its office in Brownsville, Tenn., and built 83 miles of pipe in that state.

Spread 3, with C. E. Shivel as superintendent, started on the remaining work the contractor had started in 1955 and ended up with the construction of 31 miles of the 30-in. in Indiana. Headquarters were in French Lick, Ind.

Spread 4 was headquartered in Princeton, Ky., under C. R. Ice, superintendent, and completed 83 miles of the mainline in Kentucky.

Spread 5 also kicked-off this year on unfinished work from last year's construction and put in 31 miles of the line while working out of Edinburg, Ind. W. H. Olrich ran the spread. Upon completion, the spread moved to Muncie, Ind., for another 18-mile section of the line.

During September, H. C. Price Co. started work on a sales lateral in a joint venture with Houston. The line is 121 miles of 22-in. from Defiance, Ohio, to Bridgman, Mich. Price has the western 46-mile stretch.

Construction weather during the period spreads were in the field in 1955 was pretty average. If anything pronounced, it was probably wetter than average. When the spreads kicked off in the spring of 1956, however, wet weather was definitely a detriment. As late as April 16 of this year there was 3300 ft. of trench full of water near Tepetate, La. Conditions such as these existed all up and down the line. Equipment was taxed to the maximum as the contractors tried to keep spreads working in the mud when the rains would let up enough to fire-up at all. Many days it was "just to wet to plow." Time was lost all along the line.

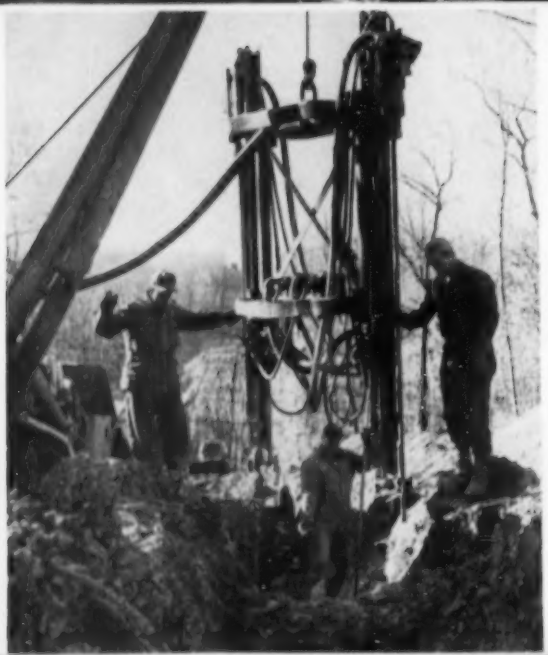
But, finally, after it seemed that there would be no end, the rains abated enough to allow spreads to really throw in equipment to augment the work in order to get the pipeline in and on schedule. When they got the weather, they really had to roll.

Pictorial record of construction progress

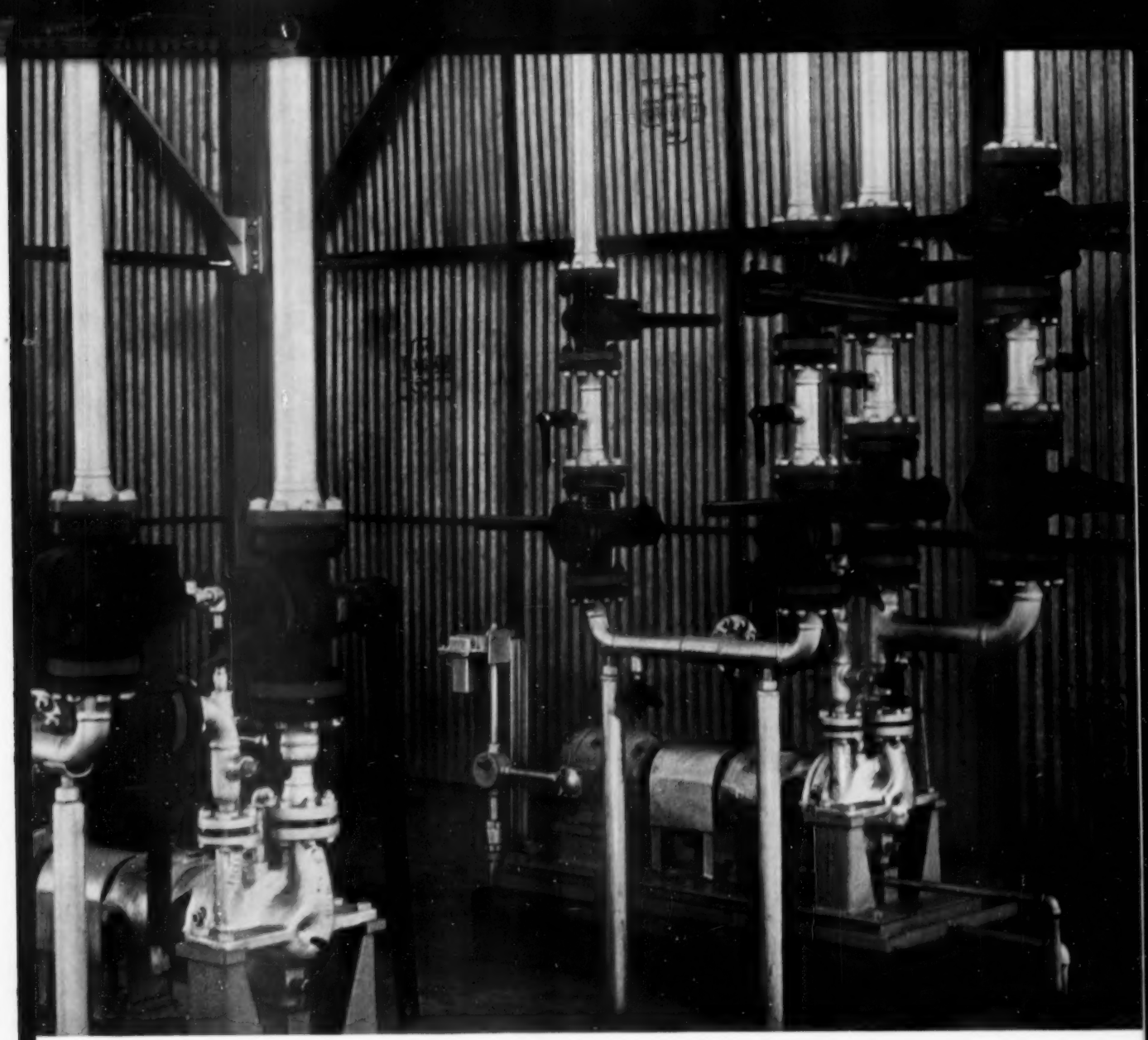
After the right-of-way was mapped, the brush and dozer gang was up front on the spread clearing brush and trees, and constructing necessary access roads. Here, a dozer bulls its way through dense woods.

Wet weather and some snow made stringing operations difficult during periods on the American Louisiana pipeline. Truck is picking up pipe from a stockpile and will then haul it to the right-of-way for stringing.

A ditching machine makes trench behind the stringers. As is usually the case in pipelining, some of the American Louisiana route was easy to trench, as this picture shows for example, and some was rough.



Twin wagon drills are brought into play as the spread hits hard rock. Blasting technician is in trench to charge shot holes with dynamite and tamp it home.



The "extras" cost no more

When you use Rockwell-Nordstrom valves you get "extras" you can't buy in ordinary valves. Pressurized lubrication in the Sealdport* system assures leakproof sealing (without uncertain "forced" seating), and eliminates costly wearing friction. Because they are rotary plug valves, quarter-turn operation and unexposed seating are two more money saving extras. The cost? Rockwell-Nordstrom valves cost no more to buy (often less) than ordinary valves and cost much less to use.

Forty years of lubricated plug valve leadership by the original and world's largest manufacturer is your assurance of economy and trouble-free dependability when you specify Rockwell-Nordstrom valves. Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania.

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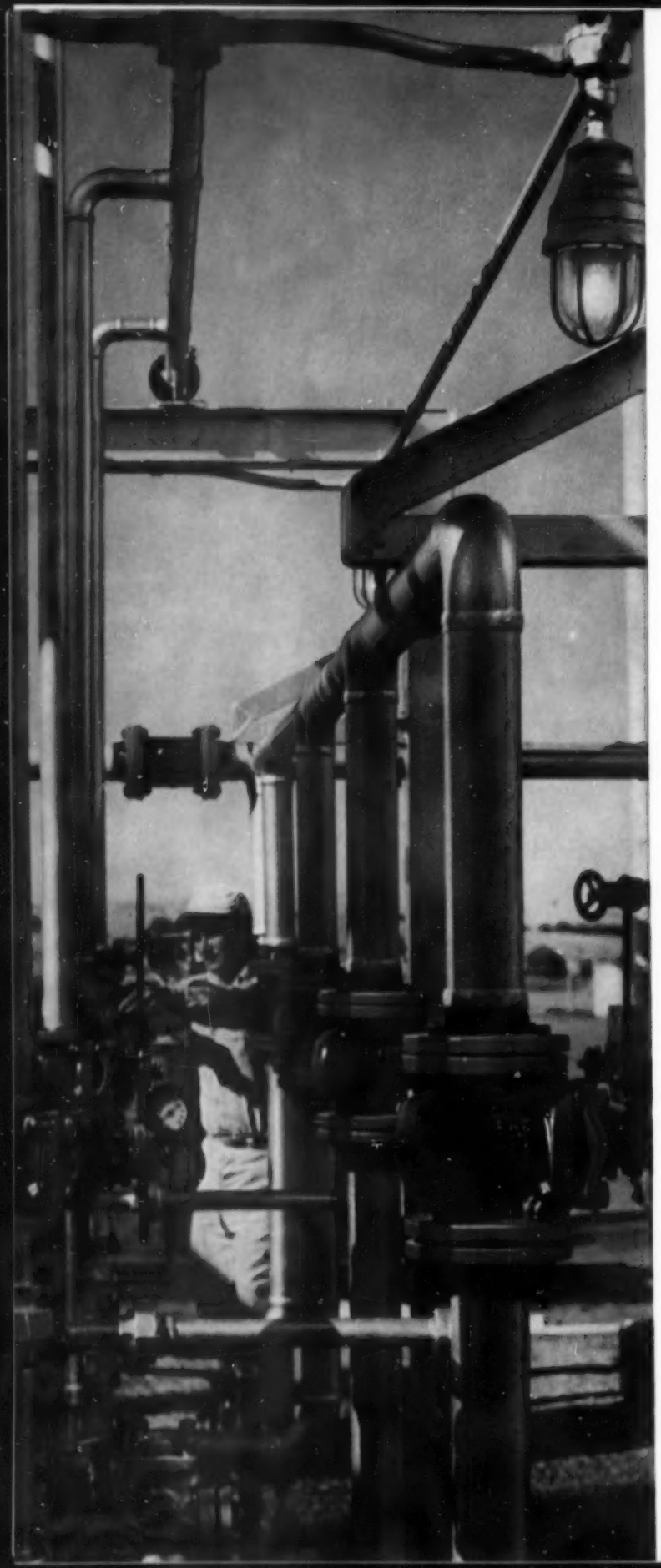
ROCKWELL-Nordstrom VALVES

Lubricant Sealed for Positive Shut-off

40th Year *of lubricated plug valve leadership*



Complex manifolding made easy

You can use Rockwell-Nordstrom valves in complex manifolds where ordinary valves wouldn't even begin to fit. Because they have no heavy, bulky bonnet cavities or rising parts, Rockwell-Nordstrom valves take little more space than their flange diameters. Additional advantages: positive shut-off prevents product contamination; firmly seated plug and rugged construction prevent shock load failures that are common to ordinary valves on pulsating flow.

Rockwell-Nordstrom valves cost no more to buy than ordinary valves—and they cost far less to *use*. Available in a complete range of sizes and pressure ratings in semi-steel, steel, stainless and corrosion resisting metals. For details, write: Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania.

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ROCKWELL-
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VALVES

Lubricant Sealed for Positive Shut-off

40th Year
of lubricated plug valve leadership

After a rocky area is shot, the backhoes and clam shells move in to make trench to designer's specifications.

When American Louisiana's line passed through swamps, river clamps were brought up to hold the pipe in the trench. The pipeline had to be built with a 12-mile continuous shove in one swamp.

After joints are properly lined up and the stringer bead run, the firing line welders take over to complete the weld.

Welds were X-rayed in the field to assure the soundness of the welding procedure and the finished joint.

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HERE are new Microwave "Packages" by Philco, pioneer in the design and manufacture of microwave systems. Each new package incorporates advanced techniques in communications and control. All components have been selected for superior performance and greatest reliability. Outstanding features of Philco Microwave Packages can lower your installation and operating costs; write Philco now for complete information.

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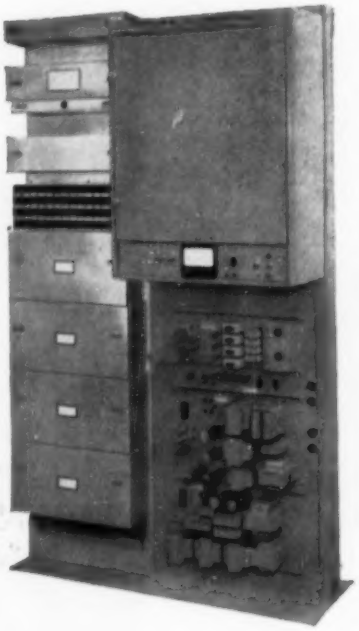
Philco Series 500 Package is designed primarily for pipe line and railroad companies requiring maximum dependability consistent with highest commercial performance standards along extensive right-of-way routes.

FEATURES

- Expandable to 24 or more channels (plus service channel)
- Extendable to 40 hops (1000 miles)
- Commercial quality circuits



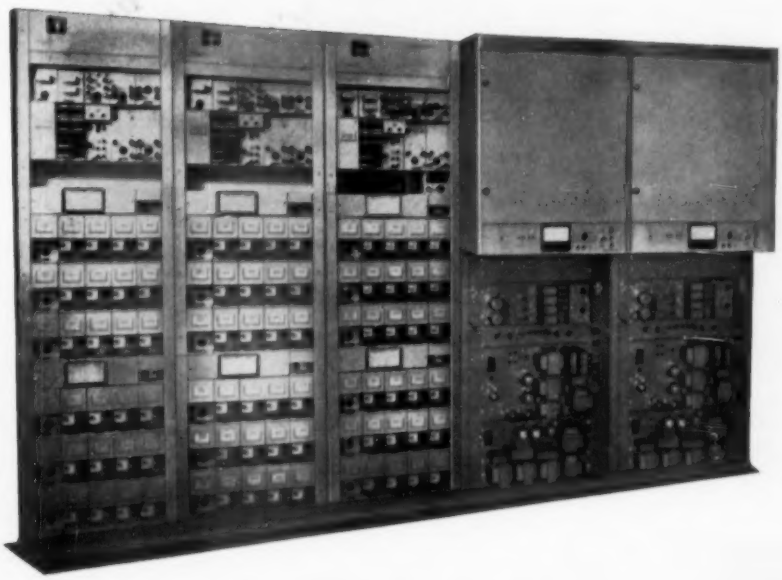
PHILCO Series 120

Philco Series 120 Package is designed to provide low cost, reliable communications over moderate distances for turnpikes, police, and utilities.

FEATURES

- Lowest cost per channel mile
- Expandable to 24 or more channels (plus service channel)
- Extendable to 10 hops
- Commercial quality circuits

Microwave "Packages"



PHILCO Series 90

Philco Series 90 Package is designed to provide the high performance and reliability required by common carriers and government agencies. Full 100% standby with completely automatic switching is included.

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- *Expandable to 60 channels
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Pictorial record of construction progress

The coating and wrapping gang follows the firing line welders as the American Louisiana pipeline goes through the rice producing country in Louisiana.

Lowering-in gang drops a section into the trench. Spread men and inspectors will make sure the bending gang (following the ditchers) has done its job well so the pipe will fit the trench.

Tie-in welders join two long sections of the coated and wrapped pipe. Welding skill is always an important factor in pipelining, particularly when API 5LX pipe is specified.

Backfill and clean up gangs bring up the tail end of the pipeline spread. Care must be taken to prevent damage to the applied protective coating. A good clean up job builds the pipeline's public relations with the landowners.

Pipeline crosses nine rivers en route north...

Nine underwater crossings of rivers, lakes, swamps and marshes can be classed as major as the American Louisiana pipeline threaded its way from southern Louisiana to Michigan. Five of these are river crossings that posed formidable problems to the engineers designing the line. By far the most interesting crossing is, of course, that for the Mississippi.

A detailed study of the Mississippi gives an excellent insight to the planning and precision that must go into just one phase of a major pipeline construction project. It illustrates the importance of technical fields outside of those usually associated with transmission companies.

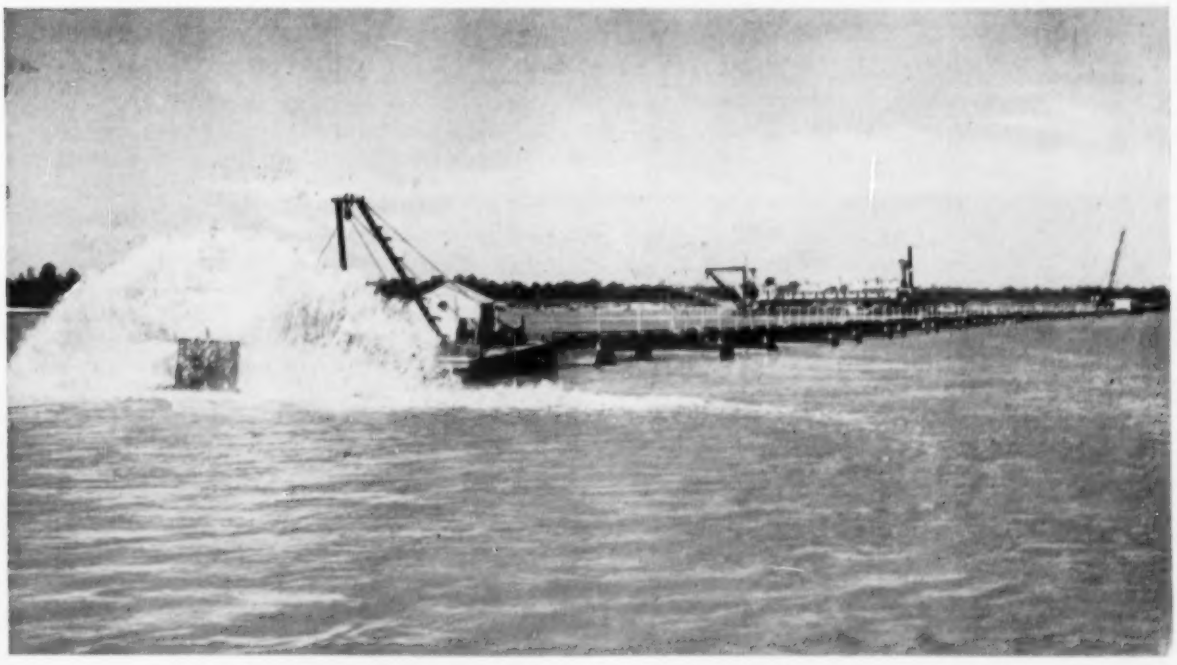
The Mississippi River is most capricious. It changes depth and course constantly due to bank erosion and silt deposit. Engineers have, to a certain extent, managed to control these variables on a large scale, but a pipeline crossing involves a very small transverse section of a river and on such small scale, the river is its own master.

The first engineering task was to locate the most favorable crossing point near Greenville, Miss. It was necessary to cross in this general vicinity because the selected route of the line intersected the river at this city. To go very far up or downstream would mean the line would be lengthened unnecessarily and the cost of the entire project would be increased proportionately. Cost was an important factor in crossing the Mississippi—the single crossing cost $2.75 million.

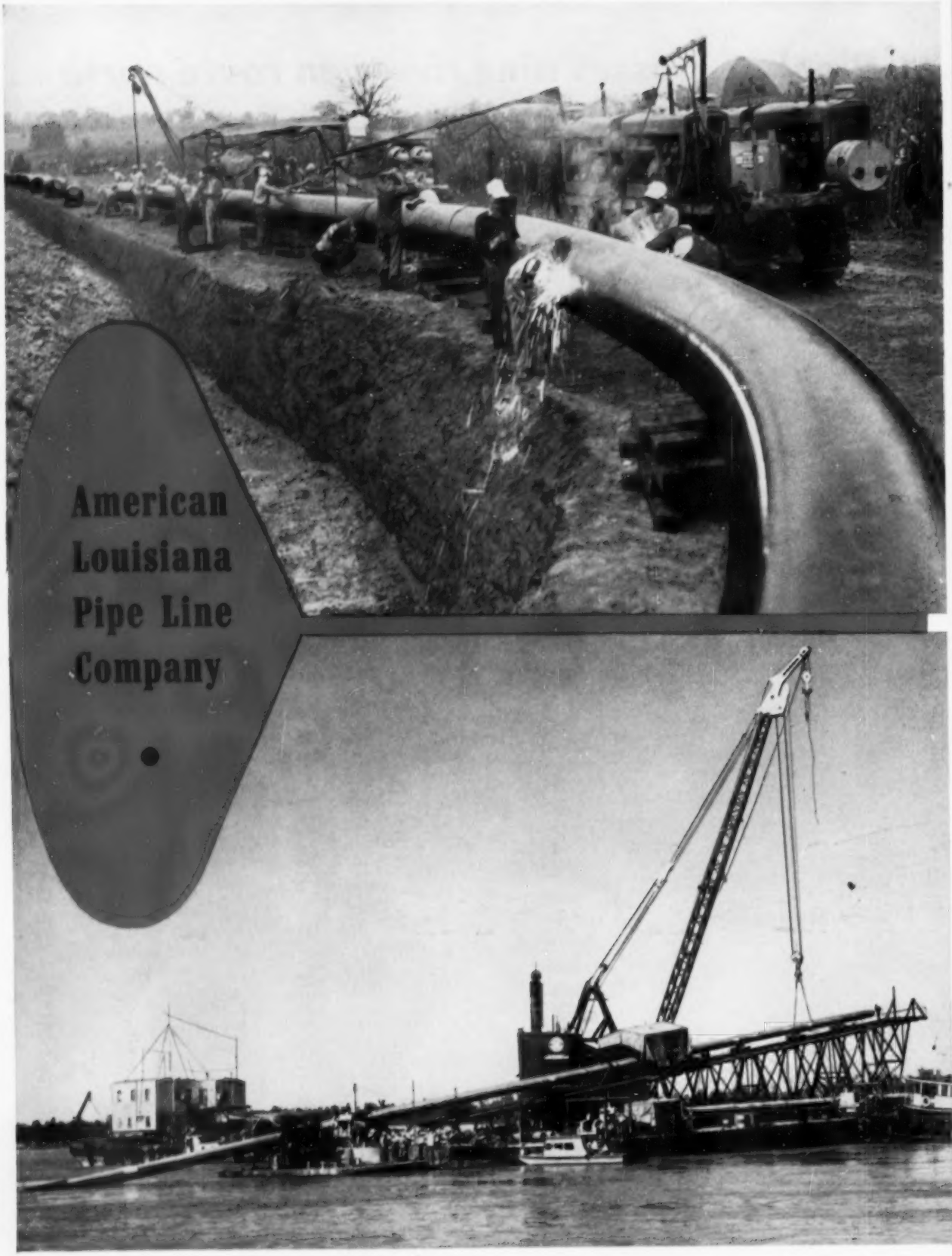
Pyburn & Odem, consulting river engineers (Shreveport), were retained for the project and made a detailed analysis of a 20-mile section of the Mississippi in the Greenville area. History and data were assembled and processed covering river action in the section from 1881 through 1953. The objective of this research was the determination of the most stable point, in terms of changes in the river's course, within the 20-mile section.

The analysis indicated that minimum variation in river depth and bank location was experienced between river Mile Posts 517 and 522. Between these two points, the old Mississippi seemed relatively well behaved. Also, the study revealed that the maximum river depth in the range of these mile posts was such that it could be dredged.

With these established facts at hand, the engineers decided to install the crossing at MP 519.8; however, the crossing was designed for dual 24-in. OD lines, so the decision was made to install these parallel crossing runs about 500 ft. apart at MPs 519.7 and 519.8. Dual lines were selected for the crossing to assure dependability of the pipe-



Large dredge makes trench for American Louisiana pipeline across Mississippi river near Greenville, Miss.


American
Louisiana
Pipe Line
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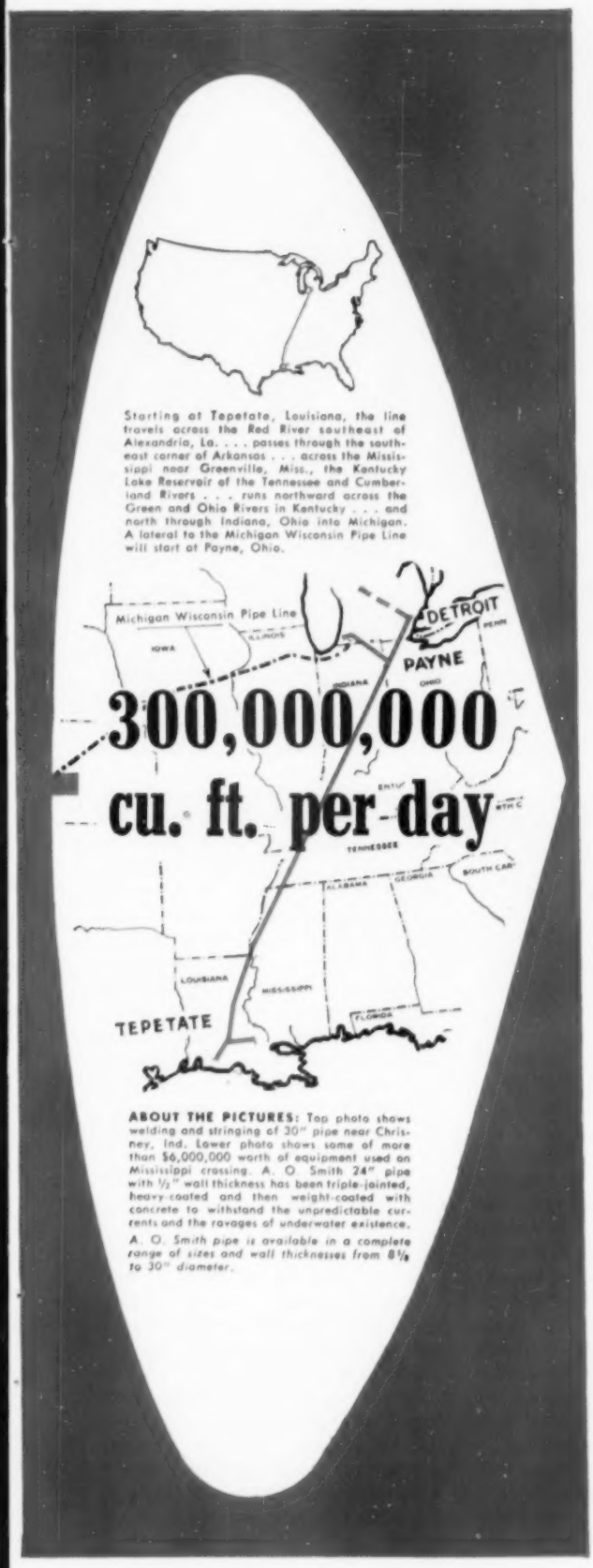
Starting at Tepetate, Louisiana, the line travels across the Red River southeast of Alexandria, La. . . . passes through the southeast corner of Arkansas . . . across the Mississippi near Greenville, Miss., the Kentucky Lake Reservoir of the Tennessee and Cumberland Rivers . . . runs northward across the Green and Ohio Rivers in Kentucky . . . and north through Indiana, Ohio into Michigan. A lateral to the Michigan Wisconsin Pipe Line will start at Payne, Ohio.
Michigan Wisconsin Pipe Line
DETROIT
PAYNE
300,000,000
cu. ft. per-day
TEPETATE
ABOUT THE PICTURES: Top photo shows welding and stringing of 30" pipe near Chrisney, Ind. Lower photo shows some of more than $6,000,000 worth of equipment used on Mississippi crossing. A. O. Smith 24" pipe with ½" wall thickness has been triple-jointed, heavy-coated and then weight-coated with concrete to withstand the unpredictable currents and the ravages of underwater existence.
A. O. Smith pipe is available in a complete range of sizes and wall thicknesses from 8⅝ to 30" diameter.

793 Miles of A. O. Smith Line Pipe

THE new American Louisiana Pipe Line is being built to meet the tremendous requirements for additional supplies of natural gas in Michigan, Wisconsin and parts of Iowa and Missouri. When complete it will bring 300,000,000 cu ft of gas per day to these states. This capacity can be increased to 550,000,000 feet per day by the addition of compressor horsepower.

The main line will be 30" in diameter and extend 1000 miles from southern Louisiana to a connection with Michigan Consolidated Gas Company at Willow Run. It will cross 8 states and nine major rivers and lakes, marshes, swamps, rice fields, forests and the mountains of Tennessee, Kentucky and southern Indiana. Also, approximately 78 miles of 24" and 26" main line will be laid in southern Louisiana.

The pipe line system was designed by Ford, Bacon & Davis, Inc., and construction is being done by H. C. Price Company, Houston Construction Company and Brown & Root, Inc.

A. O. Smith Corporation played an important part in this new line by furnishing 758 miles, over 75%, of the 30" pipe from its Houston Mill, A. O. Smith Co. of Texas, and 35 miles of the 26" pipe, together with the 24" heavy wall pipe used for the major river crossings, from its Milwaukee Mill.

For almost 30 years A. O. Smith has held a high-standard of quality control and this quality control has been maintained at every step of the manufacturing process. That's why A. O. Smith pipe made and installed in 1928 is still in operation. That's why so much A. O. Smith pipe has been used in nearly every important high pressure line.

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line in the event that river scour, river traffic, or some other unforeseeable cause resulted in damage to the pipeline. Had one 30-in. been installed, such an accident might kill the line until repair could be made; however, the probability of an accident taking out both runs in the dual crossing is very remote and, if one leg is lost, the other can carry the line until repairs are in.

The depth at which the crossing lines were installed was determined by considering the lowest recorded bottom of the river during the period of its recorded history—57 ft above mean sea level. The engineers determined that the crossing lines should be layed at a depth of 25 ft above mean sea level when passing under the Mississippi's channel, and at 40 ft above mean sea level under the remainder of the river.

The sag was carried back 800 ft from the bank on both sides of the river. This was necessary to prevent the line from being uncovered by erosion to the banks. Such were the precautions taken to assure that the pipelines were not uncovered, scoured out, and undercut during the period of their expected economic lifetime.

Dredges moved in and started making trench in the river bottom during June 1955. The prime contract for the Mississippi was with J. Ray McDermott & Co., Inc. (Houston). The width of the river at the crossing point is about 5000 ft, so this distance plus the 800 ft trench back into each bank (a total of 6600 ft for each line) had to be excavated or dredged. McDermott had two, and sometimes three, dredges working 24 hours a day to remove the estimated 5.2 million cubic yards of material from the trenches. Some of this dredging was subcontracted to McWilliams Dredging Co.

After the trenches were completed, the dredges "swept" each trench just prior to installing the pipe. This was necessary to remove logs, silt, and debris that collected in the trenches during the dredging operations.

Pipe laying activities started on the west bank (channel side) of the river. There, the first joints of pipe were anchored to the bank. Then, the lay barge worked across the river adding a triple jointed section (120 ft) of pipe at a time and moving a respective triple jointed pipe length as each section was added. The line from the lay barge was floated with pontoons with buoyancy calculated to gradually lower the line into the trench as more and more line was made.

Crossing Ford Lake near the terminal point of the American Louisiana pipeline.

The lay barge was equipped for all the operations required to align the pipe, weld the joints, X-ray the welds, and coat the pipe. The 24-in. x 0.500-in. wall thickness pipe weighed 125.5 lb/ft, but was given a negative buoyancy by the addition of concrete coating. It was applied over a coating of hot enamel, glass fiber wrap, a second hot enamel coating, and an asbestos felt wrap. The reinforced concrete coating had an applied density of 180 lb/ cu ft and was specified at 2-in. thick. This added about 100 lb/linear foot of pipe and made the coated pipe about 1.3 times its uncoated weight; therefore, the coated line was not susceptible to floatation.

One of the final operations was an underwater inspection of the crossing lines by divers to make sure that they were fitted in their trenches and clear of debris. The dredges then pumped the spoil removed from the trenches back into the excavations to provide adequate cover for the pipelines. Marker and warning signs were installed and the crossing was ready for operation.

The other river crossings were unspectacular when compared to the Mississippi river job; however, the same care and precision was used in their design and the construction of such projects is never really routine. Each presents special problems for the engineers and construction spreads. The next most important river crossings were the Red river and the Ohio river as each of these was crossed by twin 24-in. lines, as was the Mississippi. The construction techniques were basically identical with the Mississippi project. Total cost of each was under $600,000.

Other major river crossings were made with single 30-in. runs. Some of the line that ran through swamps, bayous, and minor rivers was weighted with various numbers of 6200 lb. Anchor-Wate river clamps.

River crossing valves were equipped with Shafer gate valve operators to automatically shut-off the flow of gas in event of a failure within the confines of the crossing. Pig traps were installed at each of the major dual line river crossings.

Railroad and highway crossings

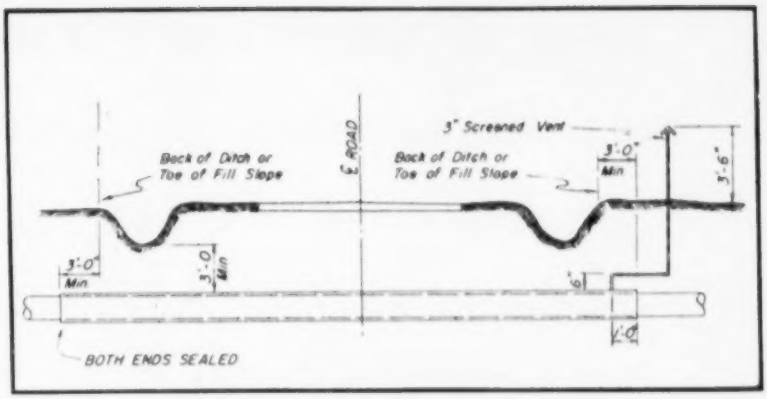
Not all of the road and highway crossings were designed to standard specifications because the various railroad district engineers and highway departments in the several states have different basic requirements. However, in every case the provisions of the ASA B31 Code were exceeded and all local requirements complied with at the same time.

For both undercrossings, 30-in. mainline pipe was cased in 34-in. pipe and 22-in. was cased with 26-in. Minor roads and trails, in compliance with the Code, were not cased.

Typically, minimum cover for railroad crossings was 52 in. and that for the highways was 36 in. The greater cover is required for the railroad crossings due to the higher stresses that are developed by heavy engines, and trains, on the tracks.

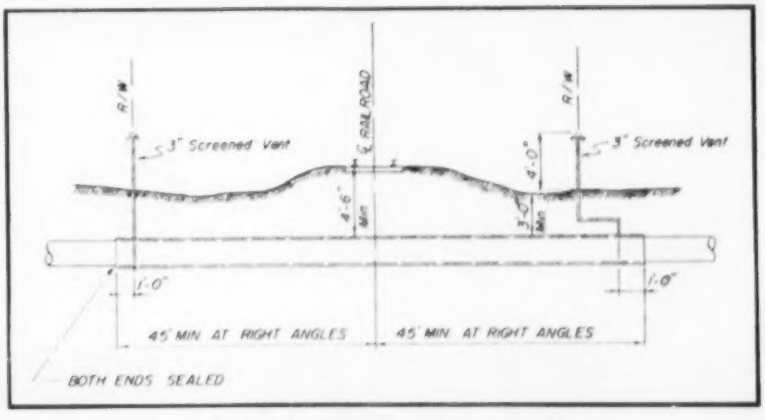
Railroad crossing casing was vented at both ends; for the highways, casing lengths up to, and including, 60 ft were specified installed with a single vent on the high end taking off from the top of the casing. Where lengths of casing over 60 ft were run, two vents were specified, with the one on the high end tied-in to the top of the casing and the one at the low end coming off the bottom of the casing. Vent risers were made from 3-in. nominal diameter pipe with screened outlet. Fleet-Line markers were used on many of the risers to identify American Louisiana as the owner of the pipeline.

Casing for both types of crossings were sealed at both ends. Spacers and insulators were used to maintain clearance between the mainline pipe and the casing. Bonded plastic seals were used to close both ends of the annulus. T. D. Williamson Inc., (Tulsa), furnished all sealing, insulating and spacer materials for all crossing on the 30-in. mainline.



Standard for highway crossing construction.

Earth auger is boring hole and inserting casing as a highway crossing is made. Winch takes up line through block and tackle secured to deadman as the auger bit makes the bore.



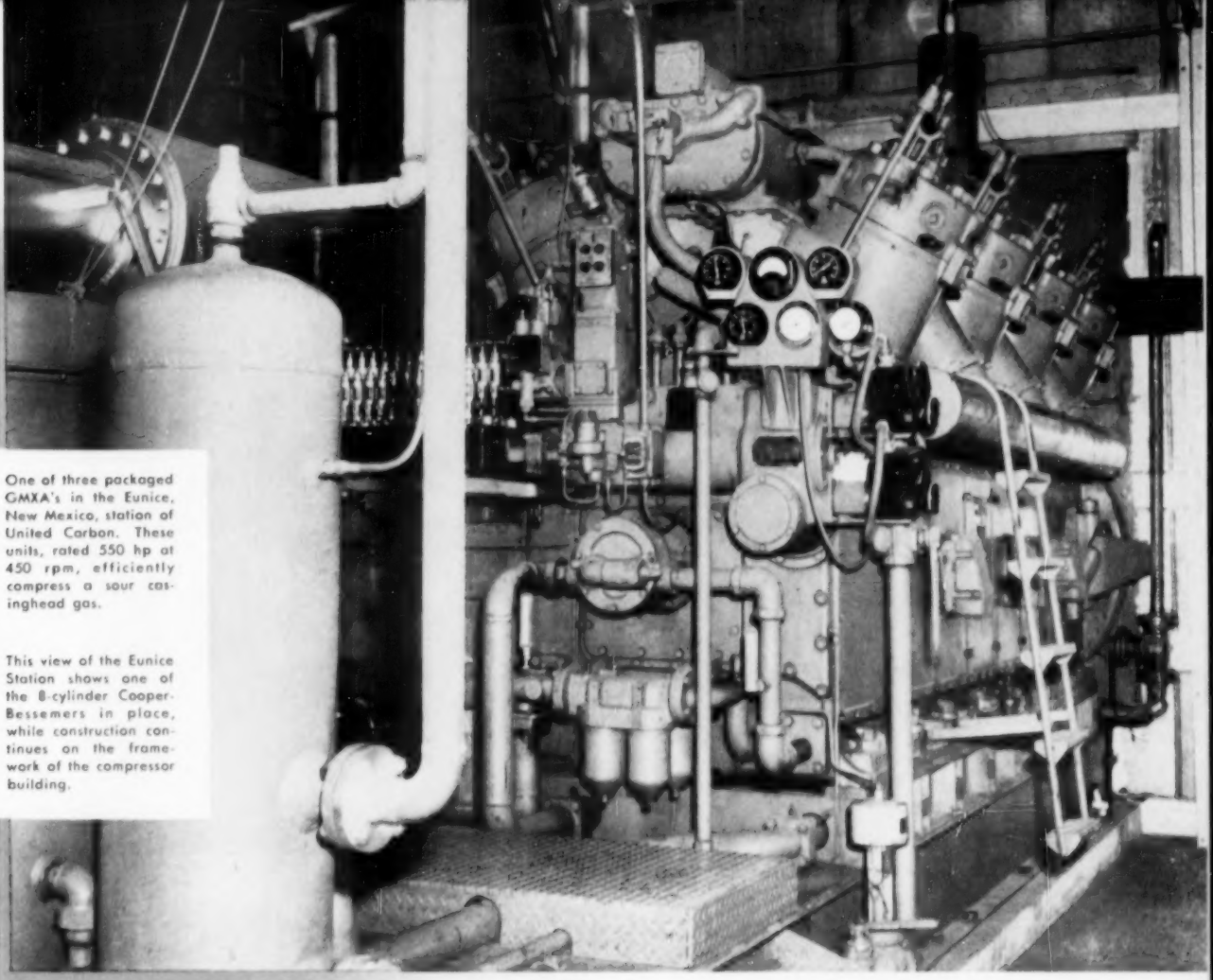
Standard for railroad crossing construction.

How UNITED CARBON sets a new LOW in compressor station costs with PACKAGED COOPER-BESSEMERS

ANGLE

Compressors

New York City Washington, D. C. New Orleans Los Angeles and San Francisco
Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Chicago



One of three packaged GMXA's in the Eunice, New Mexico, station of United Carbon. These units, rated 550 hp at 450 rpm, efficiently compress a sour casinghead gas.

This view of the Eunice Station shows one of the 8-cylinder Cooper-Bessemers in place, while construction continues on the framework of the compressor building.

● Here are details on "big savings" in United Carbon Company's Eunice, New Mexico, natural gas plant. Three Cooper-Bessemer GMXA compressors, completely packaged, provide exceptional installation economies due to pre-assembly of the following:

1. The entire cooling system.
2. The entire lube oil system.
3. The entire fuel system.
4. The entire starting air system.
5. Entire gas piping to point of inlet and outlet.
6. Elimination of costly piping and design work usually necessary in this type of installation.
7. A simple, inexpensive mat type foundation to accommodate the skid-mounted GMXA compressor.

. . . . seven good reasons that help explain why the Eunice Station *cost less to build* than any of United Carbon's previous compressor installations.

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Line coating, cathodic protection

DURING the construction phase, the American Louisiana pipeline was given protective coating and wrapping in the field. The addition of these materials is an intricate and important part of building a pipeline because huge tonnage of steel installed above and below ground is constantly subjected to several sources of corrosion. The most aggressive and costly source of corrosion is, of course, that to the buried pipe in the mainline. The protective coating and wrapping, coupled with a cathodic protection system, is designed to minimize underground corrosion and protect the pipeline against subsequent leakage and deterioration.

Each spread on the American Louisiana line had its coating and wrapping gang going strong and applying a good protective covering. It had to be good or the inspectors would not let it get into the ground. These gangs have what

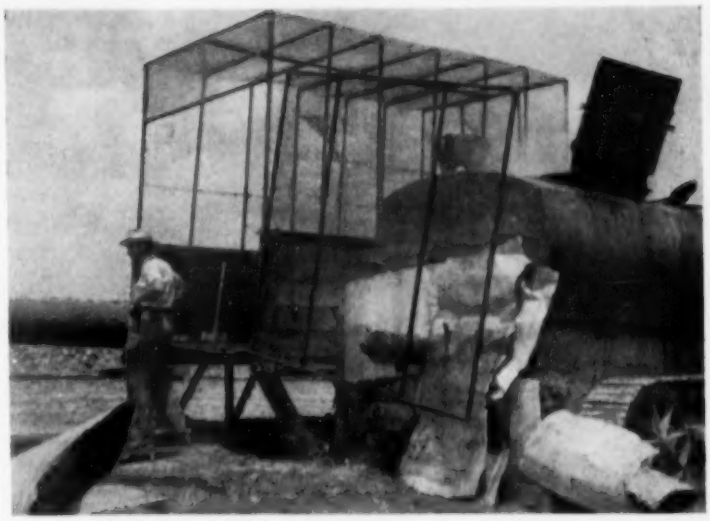
Cleaning and priming machine rolls along in front of the coating and wrapping unit.

we think is the hottest, least desirable task among those required to put in a pipeline. The weather is generally hot when pipelining, the hot enamel makes it hotter, and the smoke and fumes from the enamels never did our tender skin any good or stimulated our city-bred lungs. But, we saw the dope gangs working right along without any sign of bother as the cleaning and priming machines, and coating and wrapping machines—we noticed M. J. Crose, Perrault, C-R-C and Morris-Young-Owens equipment in action—sang right along applying the continuous protective coating.

For bayou or small stream and river crossings, the shaped crossing run was often taken aside and held in the air by side-boom tractors while a second coating and wrapping was applied over the original job. This made a rather spectacular operation as the ends of the section of piping, shaped to follow the down-and-up-again contour of the crossing, were high in the air. The middle or sag part would be held just far enough off of the ground to permit travel by the application equipment.

In some sections of the line the character of the terrain was distinctly rocky. Usually, this calls for hauling in satisfactory soil to pad the trench to prevent sharp rock points and edges from contacting the pipe and breaking or wearing the protective coating during or after lowering-in operations. An interesting solution to the high cost of picking up and hauling in padding for the trench was used on the H. C. Price spread working in Indiana early this summer. They were using an M. J. Crose Manufacturing Co. (Tulsa), pipeline ditch padder for this task. This self-powered machine is handled from the pipe-layer of a crawler tractor that moves it along the spoil bank at a steady pace. The screening head and conveyor team up to sort select soil from the spoil bank. The picked-up soil is maintained rock free and is put in the trench in a single padding operation. This is welcomed, efficient support of the field-applied protective coating.

Various coating and wrapping materials were used for sections of the American Louisiana line. Some of the spreads we saw were applying Reilly 230-A primer and Reilly plastic enamel with Johns-Manville 8 lb pipeline felt. From 20 to 25 per cent of the line was wrapped with 8 lb asbestos base, glass fiber reinforced pipeline felt supplied by Perrault Equipment Co., and manufactured to Perrault's specification by the Phillip Carey Co.



One spread contractor found he didn't have to buy so many fine cows when he had enamel chopped in this cage, prior to dumping it in the dope kettle.

About 100,000 squares of Kermac (Kerr-McGee Oil Industries, Inc.) wrap was supplied by Midwestern Pipeline Products Co. The latter company also supplied Owens-Corning Fibreglas wrap and Keystone felt wrap.

The hot primer, enamel, and reinforcing and outer wrap system of coating was used for the entire project except for a single 10-mile section of the 30-in. mainline. Such coatings have proved their value on many lines in the past and are standing up under current evaluation methods. Such coatings are considered rather routine today in view of their wide acceptance. Control of the materials' properties, the application conditions, and the inspection of the finished coating and the way the finished covering is handled as the pipeline is put to bed, are key factors in the pipeliners' modern techniques.

Inspection of the coating on the pipeline was done visually and with D. E. Stearns Co. (Shreveport), electronic holiday detectors operating while the coating and wrapping crews were working along. After the line was lowered-in and backfilled, a surface pass with Pearson holiday detectors indicated holidays that might result from handling the covered pipe during the subsequent construction operations.

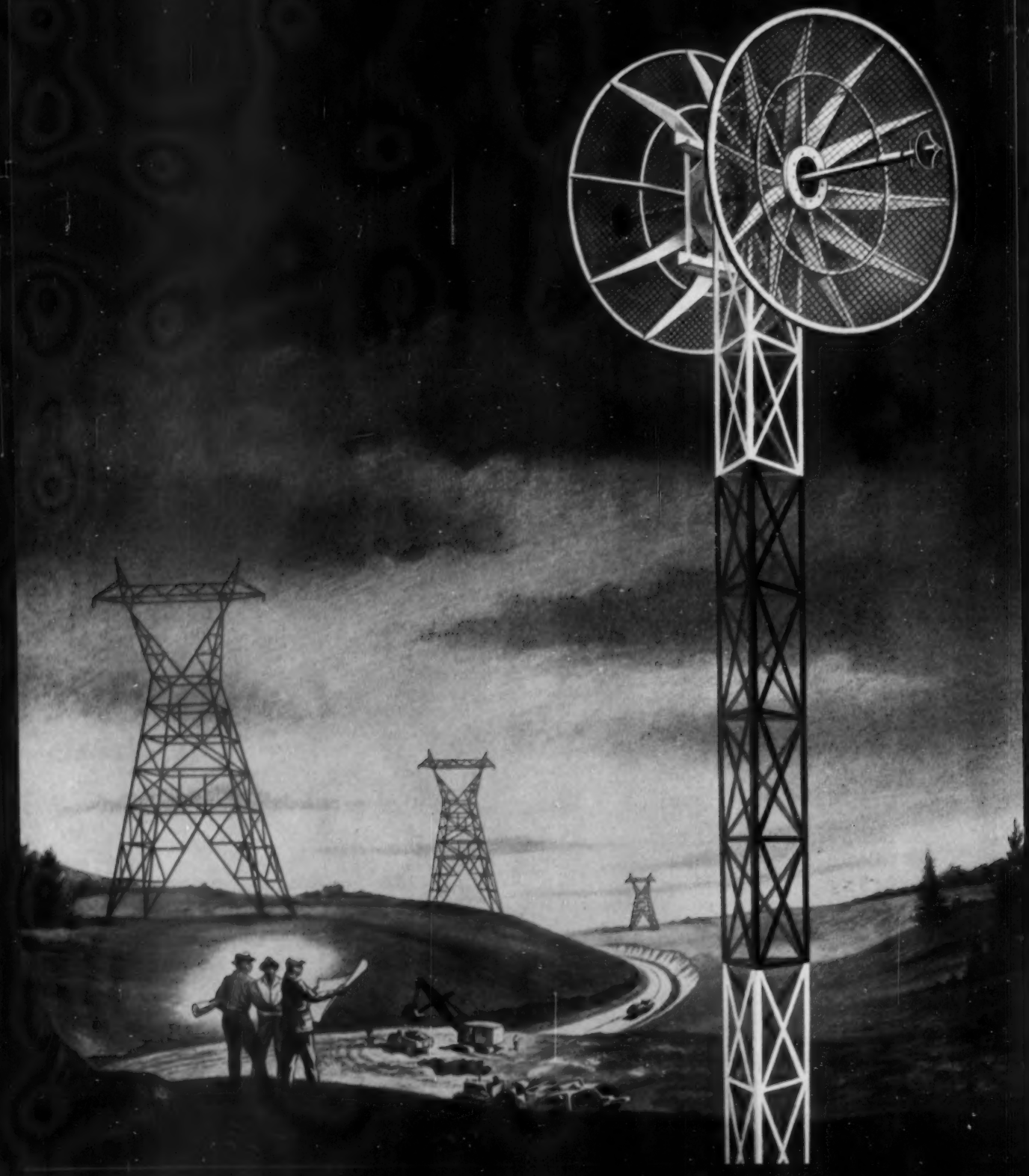
Cathodic protection was being applied after the heavy construction phase was essentially completed for large sections of the pipeline. The design and installation of the cathodic protection system was in the hands of American Louisiana's Norris Miley in conjunction with Ed Doremus' Cathodic Protection Service (Houston).

The belowground portions of block valves, other valves, pig traps, and devices that are of irregular shape were coated with Roskote (Royston Laboratories, Pittsburgh) to just above the ground level.

Any new method or technique used in building a major pipeline is of interest to the entire gas industry. In this vein, a test wrapping of the big-inch pipe developed unusually strong interest in the industry. American Louisiana had a 10-mile section of the 30-in. mainline pipe near Memphis, Tenn., protected with a wrap of polyethylene plastic tape. This was strictly a test application from American Louisiana's point of view.

The test was conducted on a section of the line being constructed by Houston Contracting Co. No primer was used, so the Remco

Dependable RCA



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wrapping machine (Remco Pipeline Equipment & Supplies, Tulsa), was able to follow as close as 20 ft behind the line-traveling cleaning machine. The Remco tape wrapper is a self-powered unit with two tape-spool arms and two outer wrap arms. It applied a spiral wrap with a ½-in. overlap. Such application of tape coatings allows pipe to be cradled into the ditch, and cleaning and wrapping can be done with one gang. It is obvious that part of the series of operations required with conventional, hot enamel coatings might be eliminated if this tape wrapping system comes into general, routine use.

The materials applied were Polyken 900 Protective Tape Coating (Kendall Co., Chicago), and an outer wrap of Kermac 12 lb bitumen saturated glass mat. The tape had a 4 mills thickness of synthetic adhesive and an 8 mills thickness of polyethylene film, for a total thickness of 12 mills. The 800 ft rolls were supplied in a 15-in. width for this test.

Record application rate for the 8-day, 10-mile test program was 9000 ft/day. The average rate for the same conditions using conventional methods was 6500 ft/day. Holiday detection was carried out in the same manner as that for hot enamel coating specifications. On the exposed piping inspection, patching averaged one for every 800 ft of pipe wrapped. After backfilling, the incidence was six holidays for the 10-mile test section.

Observers, and there were plenty of them, had many varied opinions as to success, advantages, and disadvantages of the plastic tape coating test. These are best left unreported until experience proves or eliminates charges and claims. However, it is significant that on the heels of this test on a relatively small length of big-inch pipeline, American Louisiana specified tape wrapping for the entire length of 121 miles of 22-in. pipeline that will take off from the American Louisiana mainline at Defiance, Ohio, and deliver to the Michigan Wisconsin Pipe Line Co. system at Michigan-A compressor station, near Bridgman, Mich.

Both the low and high stages of a testing compressor unit are working in the field to air test sections of the pipeline. Unit took air from atmospheric to 944 psig.

Specially designed tape wrapping machine applies tape coating and glass mat outer wrap on the American Louisiana's 10 mile test section in the mainline.

Testing to prove the pipeline

We saw an interesting testing operation originating at Slaughters, Ky., at the point where American Louisiana purchases 50 MMcf/day of natural gas from Texas Gas Transmission Corp. One of the latter company's compressor stations is located about a half mile from the sales-delivery point and is furnishing gas at 810 psig to American Louisiana for testing. American Louisiana crews, under the direction of W. R. "Bill" Clark, field superintendent of the compressor department, had moved in a portable compressor unit to boost the gas pressure to 944 psig for testing operations.

The compressor unit was mounted on a flat-bed trailer that was moved on the highways by a Mack truck. The unit was built around a Gardner-Denver, 6 x 13 RXE reciprocating compressor. This component was driven by a Caterpillar D337, 175 hp diesel engine. The power unit and compressor were linked with a Link Belt chain drive to a line shaft, and V-belt connected the line shaft with the compressor drive shaft. The engine turns at 1700

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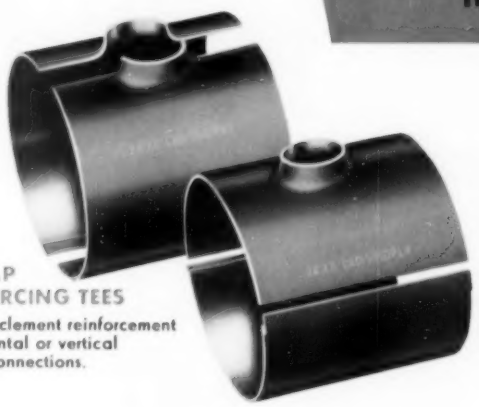

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82-page volume tabulates and graphically charts design pressures for steel pipe for gas transmission and distribution systems in accordance with recently revised Section 8 of ASA. B-31.1.8.

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Why does the welder like to work with Youngstown Electric Weld Line Pipe? The answer is apparent! Youngstown Electric Weld Line Pipe is designed for easy welding. The same physical and chemical characteristics that make for perfection in welding at the mill also contribute to efficient, dependable welding in the field. Freedom from delays in welding, speed up installation of the pipe line—reduces contractors' costs.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

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rpm and drives the compressor at 300 rpm through the reduction train. A Smithco heat exchanger held the outlet gas temperature below 70° F. The compressor unit was water cooled and the top stage of the heat exchanger used this same water for cooling the gas.

The portable compressor unit took the gas from the Texas Gas metering station and boosted its pressure to 944 psig. The piping in and out of the compressor unit was 4-in., and joined the Chicsan flexible couplings to prevent the transfer of pulsation to the permanent piping.

The test crew was pigging both north and south from the Slaughters delivery point to the next block valves in both directions. The sections of 30-in. line under test were about 17 miles in one direction and 21 miles in the other.

With the 850 psig inlet pressure, the compressor unit was able to drive the pigs at about one mph. When the two mentioned sections had qualified for their maximum allowable operating pressure, the compressor unit was moved on to the next testing location with a minimum of knock-down and set-up time, and maximum ease over the highways.

Naturally, at some testing points, high pressure gas wasn't available. In those instances, another portable, trailer mounted compressor unit was coupled with the described equipment. The unit we saw in operation at Slaughters then became the high stage and the other unit served as the low stage. With these components working together, air could be taken from atmospheric and compressed to specific test pressure. The scraper would average about one mile per day under this situation.

Air, water, and gas were each used for testing or proving the line prior to putting it in operation. The testing medium was selected in accordance with the ASA B31.1.8-1955 Code to comply with provisions for use in the several construction location classifications. In some cases where gas was used for testing, it could be passed from one section between block valves to another. In other instances, this was not possible and air was used or gas was taken from available sources at relatively low pressure and compressed to test value. In densely populated sections, a hydrostatic test was used, predicated on the availability of adequate volumes of water at practical prices. In at least one instance, sufficient water was borrowed to test a section of the pipeline. After the hydrostatic test, the water was returned to a lake.

By whatever medium, when American Louisiana put its pipeline into service, every inch of it had been tested for absolute compliance with the Code. Safety was designed into the line and it will be operated with safety to the public and pipeline personnel and property.

Pipeline department

The pipeline department that will operate the new American Louisiana line is a mixture of seasoned pipeliners with many years of experience and recently hired men intent on making a career of pipelining. The division superintendents, about one-half of the district superintendents, and one-half of the truck drivers were transferred to American Louisiana from Michigan Wisconsin Pipe Line Co. where they gained years of experience. This group will form the hard core of the personnel that will see that the physical pipeline stays at its present top condition.

R. C. Cox Jr. is superintendent of the pipeline department. Directly under him will be three division superintendents, Joe Whipkey, southern; A. P. Dolan, central, and C. L. Pilkington, northern. Each of these will have three district superintendents reporting to him. The department operates under the supervision of R. D. McClintock, vice president and manager of construction and operations, and Rex V. Campbell, general superintendent.

Each pipeline district (there are nine of them) has about 135 miles of the line under its control for operation and maintenance. The pipeline district locations for warehouses, offices, and garages are in the center of the section for which they are responsible. The pipeline department's facilities are completely separate from those of the compressor department.

Each pipeline district works out of a combination office, warehouse, and garage building located in the district's headquarters city. These buildings are 48 ft x 84 ft Armco steel rigid-frame, transit sided. Here, vehicles, construction equipment, pipe, valves, fittings, pumps, generators, spare parts, farm type equipment, and, in fact, everything needed to maintain and facilitate emergency repair will be at hand. It takes a vast amount of equipment and parts to keep a large diameter, long distance pipeline in efficient condition. Such material must be systematically warehoused or it would be impossible to find a needed item in a hurry, or at all. The stock of items warehoused must be under a continuous inventory system so that a sufficient supply of the vital items is always in stock. Many such items are not available at the relatively remote district locations on an hour's notice, so the scheduling of purchase and delivery become intricate and important.

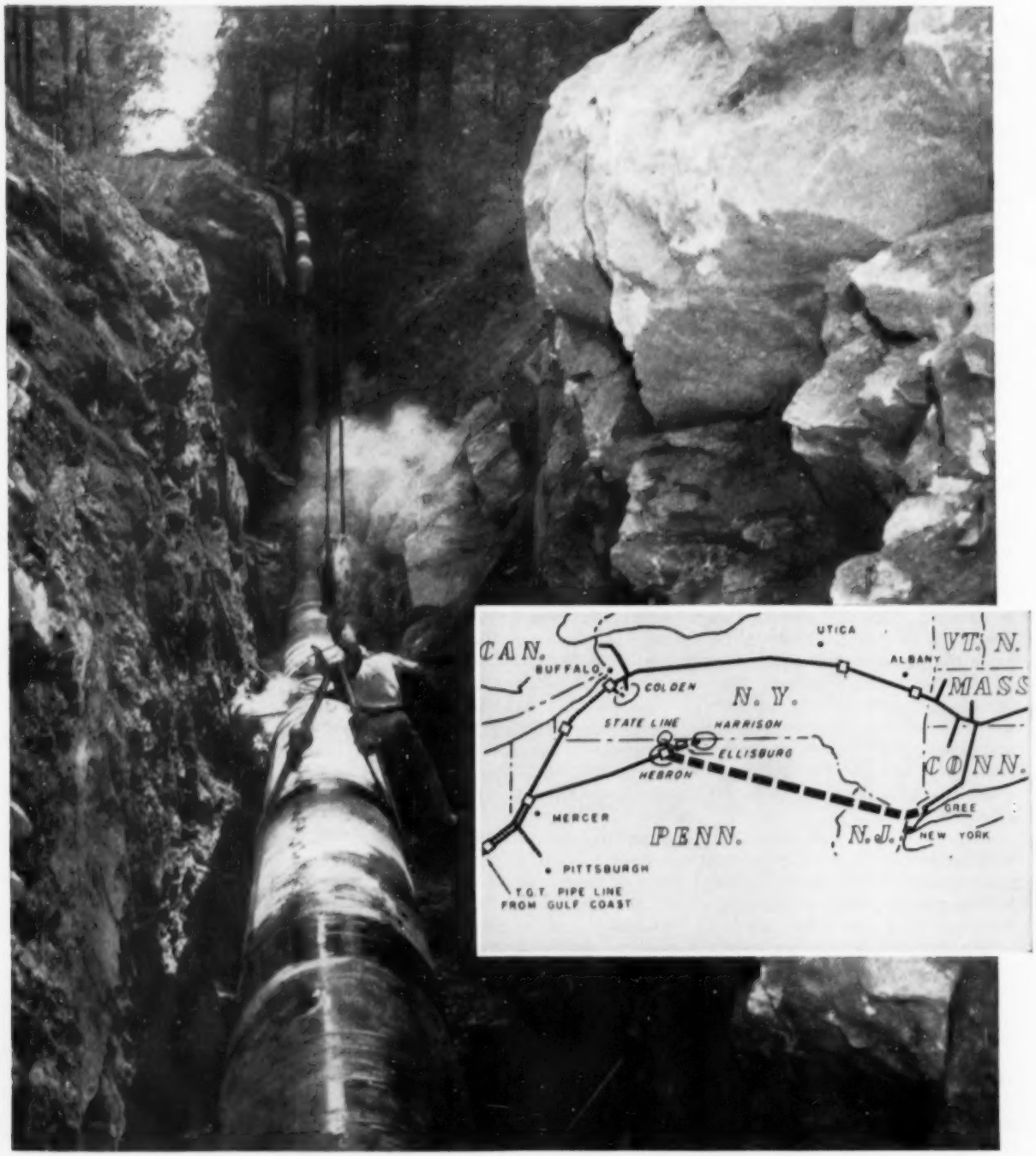
After a pipeline is completed, it is not just covered and forgotten. Actually, there is a steady flow of material going into the line year after year. Service conditions, erosion, corrosion, mechanical damage, public ignorance or unawareness, and malicious elements all take their toll as the years go by.

The pipeline department is there to inspect, detect, and rectify these detrimental factors.

In addition, the pipeline department, is constantly improving the general project. They replace damaged markers, keep the right of way clear, help fight brush and forest fires, fight the ravages of wind and water erosion, test devices for proper mechanical operation, and generally keep the pipeline operating. And, very important, they are always on call for emergencies, be it a failure of the line or some mechanism therein, or due to natural and climatic excesses. The weather never gets too rough or the problem too complex for the sharply trained pipeline crew with good equipment. They are masters of improvision and "tricks of the trade." They know that hundreds of thousands of homes and businesses depend on the natural gas in their pipeline for comfort and convenience. Their service is vital to millions of individuals. This concept is the prime criteria of their work. ■

A new look in pipe lines . . .

"THE WORLD'S



FIRST" *installation of*

NATIONAL EXPANDED SEAMLESS LINE PIPE

a 252-mile line from Hebron, Pa., to Greenwich, Conn.

Expanded Seamless Line Pipe is a new product of National Tube—never before used in a pipeline installation. The 252-mile, 24-inch line was installed by Tennessee Gas Transmission Company, from their Hebron underground storage field near Coudersport, Pennsylvania, to Greenwich, Connecticut.

The pipe was apportioned in the following sizes:

205 miles of 24-inch, ⅜-inch wall
46 miles of 24-inch, ½-inch wall
1.5 miles of 24-inch, ⅝-inch wall

• • •

Not only is National *Expanded Seamless* easier to weld at all temperatures, but it possesses greater, more uniform strength than ordinary line pipe. This high strength permits safer operation at high pressures under all conditions. And the uniform internal size of *Expanded Seamless* facilitates field line-up and welding. It is available in sizes 16-in. to 26-in. O.D., in a full range of wall thicknesses.

On all counts, National *Expanded Seamless* Pipe is absolutely unparalleled for line installations. For improved efficiency and greater economy on *your* next line pipe job, plan to install National *Expanded Seamless* Line Pipe.

IN PIPE LINES TOO . . . SEAMLESS DOES IT BETTER

The pipe laid in the populated areas was yard-coated with coal-tar enamel, glass mat, and asbestos felt. Bending was accomplished by a bending machine at the yard.

Possessing superior welding characteristics, National *Expanded Seamless* in ½-inch wall was welded with five to six beads; in ⅝-inch wall with four beads. The pipe was delivered with a 30° bevel.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL SEAMLESS PIPE AND TUBES

UNITED STATES STEEL

Now... Talk through noise

NEW TRANSISTORIZED **POWER VOICE** speaker

The secret is in the exclusive **"GOLDEN HEART"** *transistor*

Hear your mobile radio

HUNDREDS OF FEET AWAY

Now your vehicles, in fact any mobile radio equipped vehicle, can get far greater volume than ever before, with the new Motorola transistorized Power Voice Speaker.

This new compact, inexpensive speaker-amplifier combination delivers 10 TIMES MORE POWER than the conventional passive speaker. No more straining to hear messages. Just turn it up—it's got all the volume you'll *ever* need, all in this one small package. No longer is your driver shackled inside his vehicle...he can move about freely, hundreds of feet away, and still hear his dispatcher.

Secret of Motorola's newest development is the built-in transistorized amplifier, utilizing two long-life, Motorola power transistors. With the average 12 volt mobile radio system, the new speaker develops *15 watts* audio output. Even on a 6 volt system, you get 5 watts output—*much* more than the conventional one watt speaker level.

This power packed speaker is available for your mobile 2-way radio NOW. It can be quickly and easily added to most 6 or 12 volt installations. With the new Power Voice Speakers doing a bigger, better job for you, you'll also find low battery drain, bandpass response that accents voice frequencies, and versatile Quick-detach mounting...in a compact, all-metal housing.

You must *hear* the new Power Voice Speaker to appreciate what this added power can mean to you. Write, phone or wire today.. or mail the coupon below.

New POWER VOICE speaker mounts firmly under dash in same familiar position

BUT...

detaches in a second to be hung from vehicle window and may be heard clearly hundreds of feet away.

MOTOROLA... always FIRST with the NEWEST in TRANSISTORIZED EQUIPMENT

MOTOROLA
2-WAY RADIO

MAIL THIS COUPON FOR LITERATURE
or a demonstration

Motorola Communications & Electronics, Inc., Dept. 23
4501 Augusta Blvd., Chicago 51, Ill.

☐ Please send me more information on the new Power Voice Speaker.

☐ I want to hear a demonstration of the Power Voice Speaker.

NAME _____ TITLE _____

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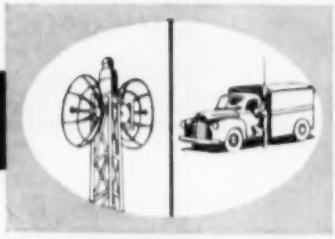
communications



By FRANK CHAPMAN

Special committee asks FCC to revise application forms

A DETAILED study of the Federal Communications Commission's forms as they affect petroleum radio licenses has been completed by a special committee of the API's central committee. The committee was established and the study initiated in response to the FCC's inquiry in Docket 11692 as to possible form revisions.

The committee, in its report, states that in considering the most often used Form 400, it was found that Items 11 and 12, which have been a source of some misunderstanding and confusion, already have been reworded satisfactorily in the July 1955 revision. For Item 6, no actual change in the form was recommended but it was suggested that the rules should be changed to support Form 400 instructions which classify a control point, or points, "same as transmitter" when located within 500 ft of the transmitter in a rural area; or within the same building, or at the same street address as the transmitter, in any urban area.

Under Item 13, the committee report emphasizes that they believe the system diagram requirement is an unnecessary burden when required in connection with a routine mobile system application and serves no worthwhile purpose. The group feels that this should be called for only on applications involving operational systems or mobile systems of a complex and unusual nature.

The report points out that the suggestions "are relatively minor and the committee agrees that FCC Form 400 is basically sound and a decided improvement over its predecessors. There is, however, a strong and unaminous sentiment among the committee members, shared by the vast majority of other licensee representatives contacted, against the use of accessory Forms 400A and 405A. We are highly appreciative of the accelerated processing accorded the Form 400A and have no wish to destroy that in any degree, but we can see no reason why the same treatment could not be given applications on Form 400 for amendments involving the same changes for which a Form 400A now may be used. Our objection to both 400A and 405A stems from the fact that each grant of either requires that an additional piece of paper be posted. By the time a base station has been amended several times to relocate, add and delete control points, and has been renewed once, as many as five to eight separate and distinct documents may have to be posted to complete a station authorization. When all such paper is posted it becomes necessary to laboriously trace changes through each succeeding amendment before the true and correct terms of the station authorization may be determined. If one document is lost, the remainder not only becomes an incomplete station authorization but in those cases involving several amendments even a person intimately familiar with the station may not realize its loss for some time, if at all.

"To meet these objections, we strongly recommend that both Forms 400A and 405A be discontinued altogether and Item 16(a) on Form 400 be changed to add two boxes, one to be marked 'Amendment,' the other 'Renewal.' The amendment box would be checked when applying for those changes in the station authorization for which a Form 400A now may be used."

The report offers the same objection to the commission's predilection for hanging on numerous attachments which become, by reference, a part of the station authorization and must be posted. The committee feels that these attachments merely repeat a section of the rules and regulations which a licensee is required to have available in any case. They suggest that in such instances at least, the "Antenna Lighting Specifications" and/or "Special Conditions" be written as references to specific sections of the Rules and Regulations rather than as references to specific attachments. The same extracts, which now are called attachments, still could be forwarded with the authorization as an explanatory note and reminder but would not require posting, under the committee regulations.

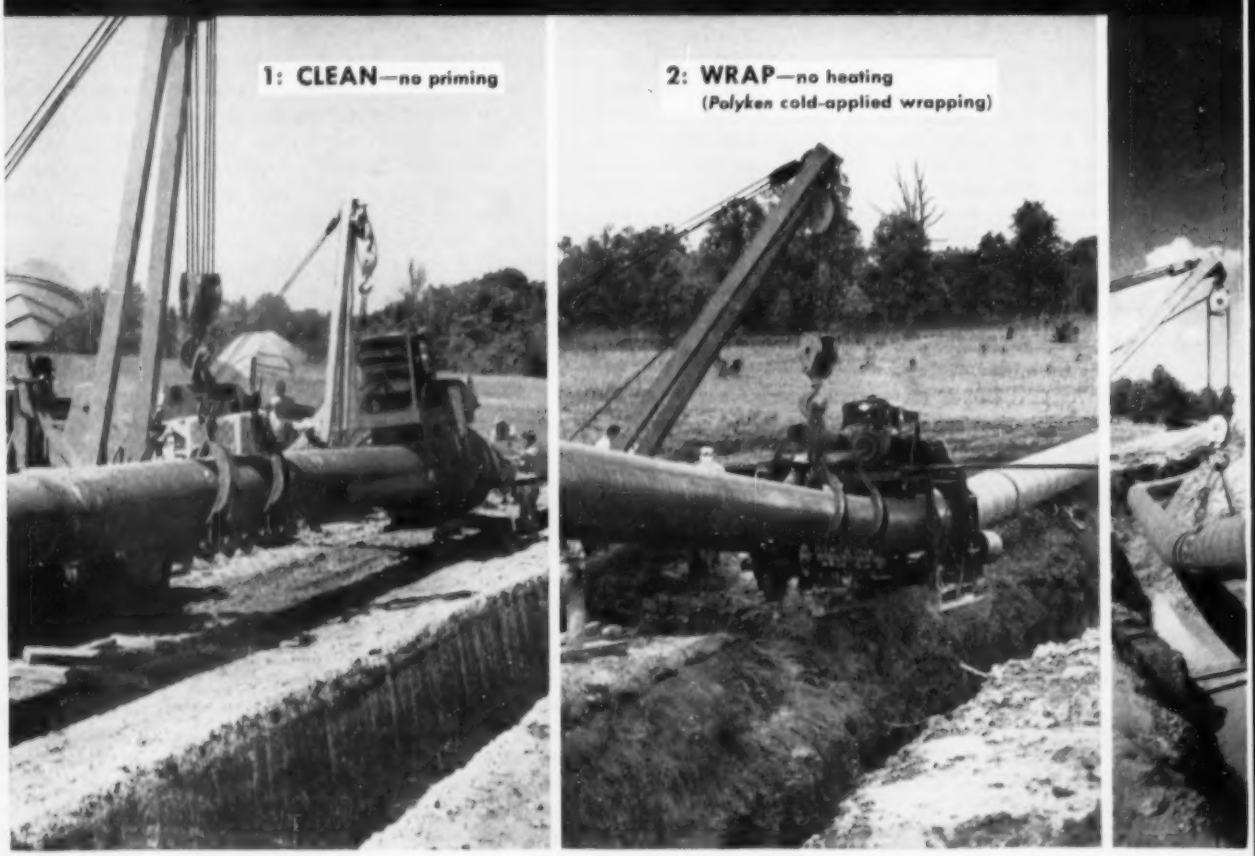
In addition to Forms 400, 400A, and 405A, the committee considered Forms 401, 401A, 403, 403A, 501, and 501A. All except 401 and 403 were considered generally acceptable, and no changes were recommended. In the case of the 401 and 403, it was suggsted that they be replaced wherever possible by Form 400 or a similar new form. ■

THE **MODERN** PIPELINE
PROTECTION MAKES NEWS:

Polyken being used on new 22" transmission

(122-mile lateral from Defiance, Ohio, to Bridgman,

SIMPLE 3-STEP *POLYKEN* METHOD



polyethylene tape American-Louisiana line

Michigan)

10-mile test showed American-Louisiana and Houston Contracting Co. these cost-cutting advantages of *Polyken* tape coating:

1. **Half as many crewmen** needed to do the job.

No labor or equipment to break drums, chop materials, melt and transfer coating—*Polyken* tape is ready to cold-apply right from the roll.

No labor or equipment to handle priming operation—*Polyken* tape is cold-applied directly to clean pipe, with the adhesive acting as its own primer.

No labor or equipment to rehandle pipe or skids after coating or to repair skid marks—*Polyken*-coated pipe goes directly into the ditch.

2. **No drying or cooling time**—pipe can be tape-wrapped right behind the cleaner and lowered right behind the wrapper; trench can be immediately backfilled.

3. **Vastly reduced warehousing, shipping and handling costs**—coverage per pound is increased; far less material is handled per mile of pipe.

4. **No hot dope liabilities** from drum cuts, spills, fumes and burns. No need for protective clothing or masks. *Polyken* taping is simple, clean, safe.

5. **Coating perfection**—simple, 3-step application puts *Polyken* coating into ground in factory-uniform condition.

These five big points in favor of *Polyken* taping, the *modern* pipeline protection, convinced American-Louisiana . . . and confirmed other results already experienced by many in the gas industry. Like to know more? To talk over your project—write, wire or phone *Polyken Sales Division*, 309 W. Jackson Blvd., Chicago 6, Illinois. WEbster 9-7100.

Complete catalog, Sweet's Industrial Construction File, Sec. 6c/Ke

Polyken® **CONTROLLED STRENGTH**

PROTECTIVE COATINGS

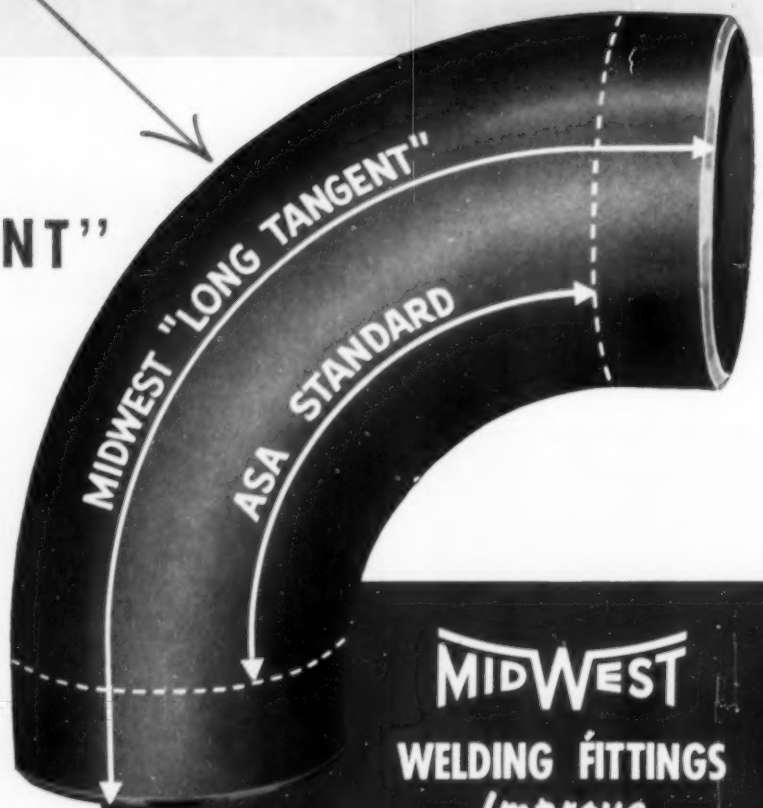
The Kendall Company, Polyken Sales Division

King Size (but at no extra cost)

MIDWEST

"LONG TANGENT" ELBOWS

Among all standard welding elbows, only Midwest "Long Tangent" Elbows can be described as "*King Size*" . . . only they have the long straight ends which equal ¼ of the nominal fitting diameter (a 12" Midwest "Long Tangent" Elbow has tangents 3" long). This greater length is responsible for significant savings on many piping systems (see advantages listed below). For additional information, ask your Midwest distributor or write us for Catalog 54.



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Plants: St. Louis, Clifton, N. J., Los Angeles

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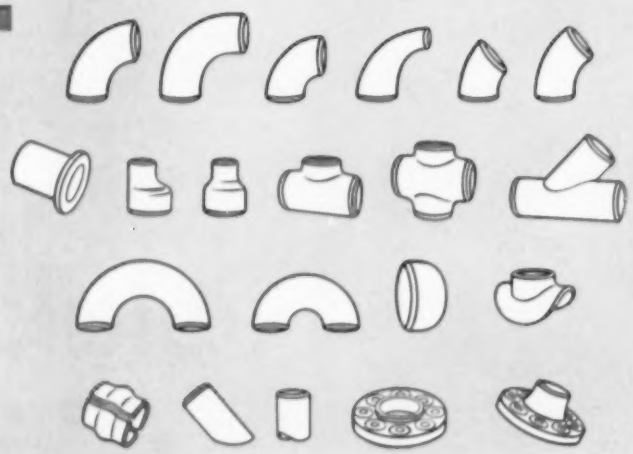
MIDWEST

WELDING FITTINGS *Improve* PIPING DESIGN and REDUCE COSTS

ADVANTAGES OF MIDWEST "LONG TANGENT" ELBOWS

- ★ They save pipe.
- ★ They often eliminate short nipples and their extra welds.
- ★ They save time and money in lining up and clamping pipe and fitting.
- ★ They make it easier to apply slip-on flanges.
- ★ They remove the circumferential weld from point of maximum stress and can be sleeved.
- ★ THEY COST NO MORE THAN OTHER ELBOWS.



MIDWEST HAS THE MOST COMPLETE LINE

7323

Design Factors in Telemetering Systems

Four important points to consider in planning for remote measurement or recording

A BRISTOL APPLICATION NOTE

Telemetering systems provide a proven way to keep tabs on a remotely located process, pipe line, service or utility. In fact, any time remote indication recording, or control is required, telemetering can serve your needs.

Here are the four conditions which must be considered in selecting the best telemetering system for any installation.

1. VARIABLES

Most industrial variables can now be measured, computed, and converted into a form that can be transmitted electrically. Their number and variety influence circuit complexity and the appearance of the receiving panel. Some variables now being successfully telemetered include:

Pressure • Current and voltage • Temperature • Flow • Electrical power • Wind velocity • Liquid level • Motion • BTU's • pH Horsepower • Speed

2. FREQUENCY OF READING

While the majority of telemeter systems in service today are the point-to-point continuous recording type, complex networks and interrelated variables are making sophisticated approaches more and more necessary. The problem usually boils down to these questions: how often is measurement necessary, and what is the least costly way to install and run the system?

Five types of possible hook-ups are:

Continuous recording—where variables are critical and need constant watch.

Intermittent indicating—where variables need only be checked at intervals.

Continuous-Intermittent—where it is possible to separate more critical variables for constant and intermittent telemetering.

Grouped-Multiplex—where several measurements can be transmitted as a group over a single circuit into a "multiplexed" receiver.

Successive-Multiplex—where measuring points over a large area can be "multiplexed" at intermediate locations, then herded to the panel.

3. TERRAIN

The type of interconnecting circuit between the measuring transmitters and central panel usually depends on the terrain: its topography, weather, and degree of settlement. Hence, signals may be carried by one, or by combinations, of the basic transmission media:

Radio—various types of radio can be used to take signals over mountains, deserts, and seas.

Wire—strung wire or leased lines can cover plant, urban, and rural areas.

4. INSTRUMENTATION

Bristol Metameter® Telemeters are eminently adapted to any of the conditions of measurement frequency, variables, or terrain likely to be encountered in telemetering. Transmission can be provided over telephone circuits, carrier current, radio—including microwave, VHF and UHF—and private wires, multiplexing and selective calling. Under all sorts of conditions, thousands of installations, ranging from just a few to hundreds of instruments each, have proven the dependability and reliability of Bristol Telemeters—pulse width (or duration), differential transformer, and voltage types, as well as pneumatic systems.

For more information on how Bristol Telemeters can benefit *you*, write THE BRISTOL COMPANY, 119 Bristol Road, Waterbury 20, Conn. 5.44

TYPICAL RECEIVING CENTER in multiplexed telemetering system.

BRISTOL *POINTS THE WAY IN HUMAN-ENGINEERED INSTRUMENTATION*

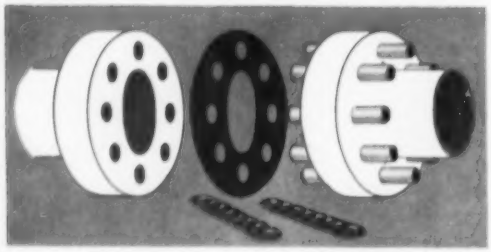
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

"Something from the Irishman"

AMERICAN LOUISIANA PIPE LINE

Protected

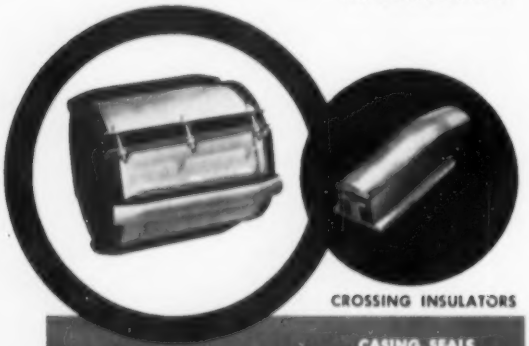
with Maloney Insulators and Casing Seals
flange insulation, scraper cups & segmental rings



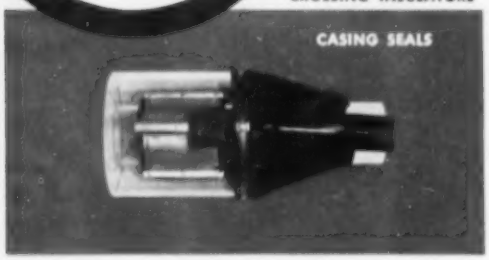
FLANGE INSULATION

SCRAPER CUPS

GRAPHITIZED MICARTA SEGMENTAL RINGS FOR COMPRESSORS



CROSSING INSULATORS



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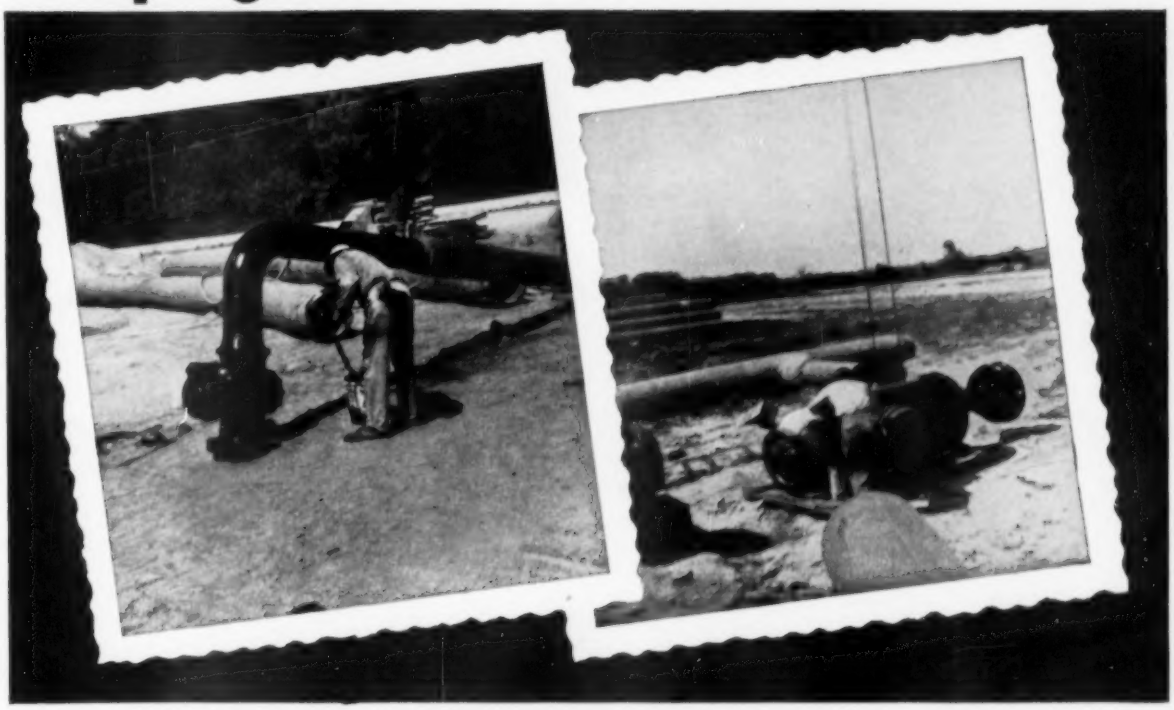
SINCE 1932 — PRECISION IN RUBBER — METAL — PLASTICS

TARSET® Protects Valves and Piping on T.G.T. "Muskrat" Line



New Pitt Chem Coal Tar-Epoxy Coating Selected for Maximum Protection in Rugged Marshland Area

In the swampy marshland terrain where Tennessee Gas Transmission Company is laying most of its new 24-inch "Muskrat" gas line, superior protection against corrosion becomes just as vital for above-ground equipment as for the underground line itself.

Relying on Pitt Chem Modified Enamel, in part, for underground main line protection, T.G.T. engineers specified another Pitt Chem product, new cold-applied *Tarset*, for the protection of main line gate valves, headers and other above-ground equipment on the gathering system.

Since the first application of Tarset in sour crude storage tanks, the use of this revolutionary coal tar-epoxy coating has spread rapidly to the gas industry and many others. *For no other cold-applied material available today offers such durable protection at such a moderate cost.*

What's *your* corrosion problem? Chances are this rugged, heavy-duty coating can help you solve it. *Write or call today for newest Tarset performance data and other helpful information.*

PITT CHEM® TAR BASE COATINGS

• Standard Grade • Modified Grade
• Plasticized Grade • Hotline
• Cold Applied Tar Base Coatings

PROTECTIVE COATINGS DIVISION
PITTSBURGH COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

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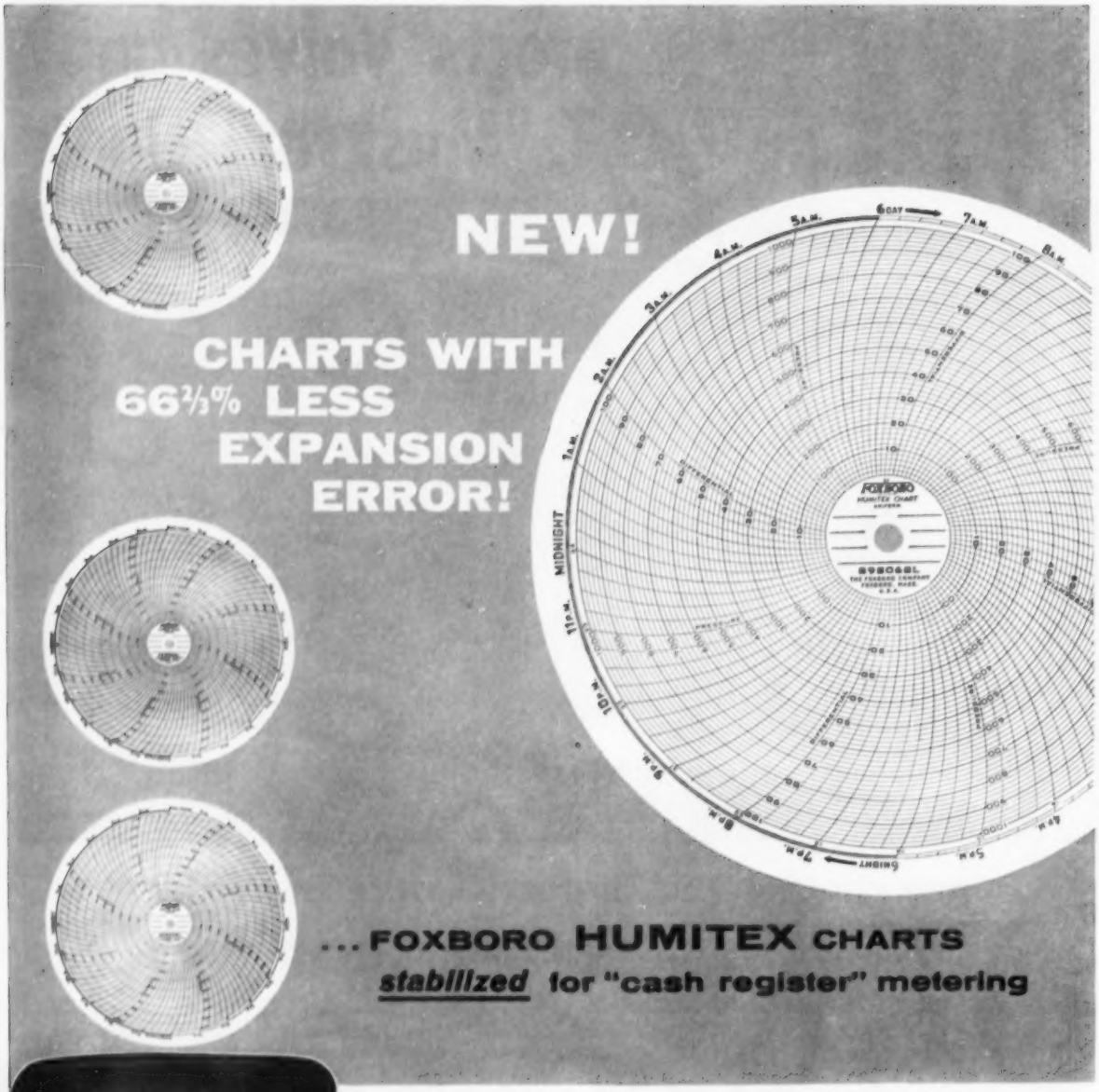
COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON



Like standard Foxboro Humitex Charts, these new *stabilized* charts have extra-high legibility too. Easy-to-read gray printing against the chart's smooth, white background brings out the full brilliance of Foxboro Recording Inks.

Here are the charts specifically designed to meet the high-accuracy requirements of "cash register" metering . . . Foxboro *stabilized* Humitex Charts. These advanced charts feature plastic-laminated paper — assure you *real* dimensional stability under the widest variations in temperature and humidity. In an extensive series of laboratory and field tests, Foxboro *stabilized* Humitex Charts were found to have only ¼ to ⅓ as much dimensional error as the highest grade of standard charts!

Foxboro *stabilized* Humitex Charts are your assurance of consistent, high-fidelity records — wherever you meter — wherever you compute. Try them at our expense. Write for samples and quotation. **The Foxboro Company, 3410 Norfolk St., Foxboro, Mass., U.S.A.**

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FOR MORE ACCURATE RECORDS **FOXBORO**

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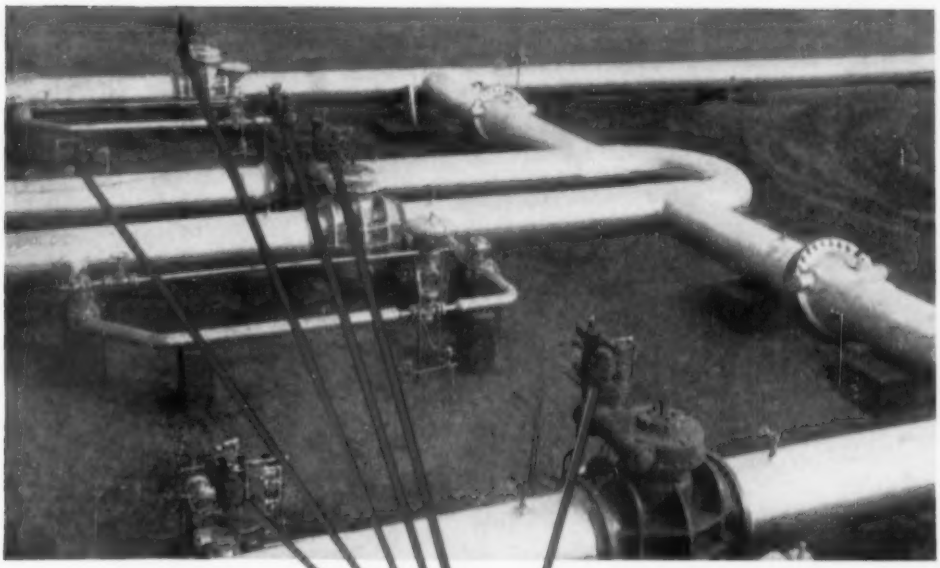
PROGRESSIVE *Gas* PIPELINERS SPECIFY



E-I-M

G-2 TYPE VALVE CONTROLS

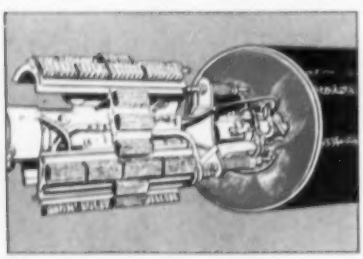
Major pipelines depend on E-I-M Valve Controls for opening and closing valves of all sizes quickly and with precision. The Type G-2 Valve Control is powered by the product in the transmission line without a pressure drop. It is activated remotely by pushbutton or radio and flashes back a signal when the operation is completed. When you need speed, dependability and accurate control for your pipeline, you know you can depend on E-I-M Valve Controls. Whatever your transmission problem, let our engineers help you solve it.

E-I-M *Company* INCORPORATED

1340 OLD SPANISH TRAIL • HOUSTON 25, TEXAS • MOhawk 4-4587

Valve Controls • Speed Reducers • Cooling Tower Drives • Control Valves

Copon internal pipe coating selected again by major gas transmission company



Thirty and thirty-six inch pipe being automatically spray-painted at mill following unique metal cleaning process.

Proof of COPON'S effectiveness in solving internal pipe coating problems lies in its growing acceptance by major gas transmission companies. This year it's being used again by one leading firm for new 30" and 36" pipeline construction in addition to many other projects.

COPON internal pipe coatings offer *even more* than outstanding protection against corrosion losses. They *pay off* in protection during storage, lowered maintenance expense and greatly reduced pigging costs. And COPON coatings make possible delivery of cleaner, rust-free gas products.

Scientifically developed systems are available for coating dehydrated gas lines, crude and petroleum product lines, salt water lines, fresh water lines, and oil well tubing and casing. Write your nearest COPON manufacturer today. He will be happy to show you how COPON can be efficiently applied to new pipe, used pipe or pipe-in-ground.

Get complete information about COPON today.

MAIL COUPON TODAY OGJ-8

Please send me information about COPON Internal Pipe Coatings.

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Company_____

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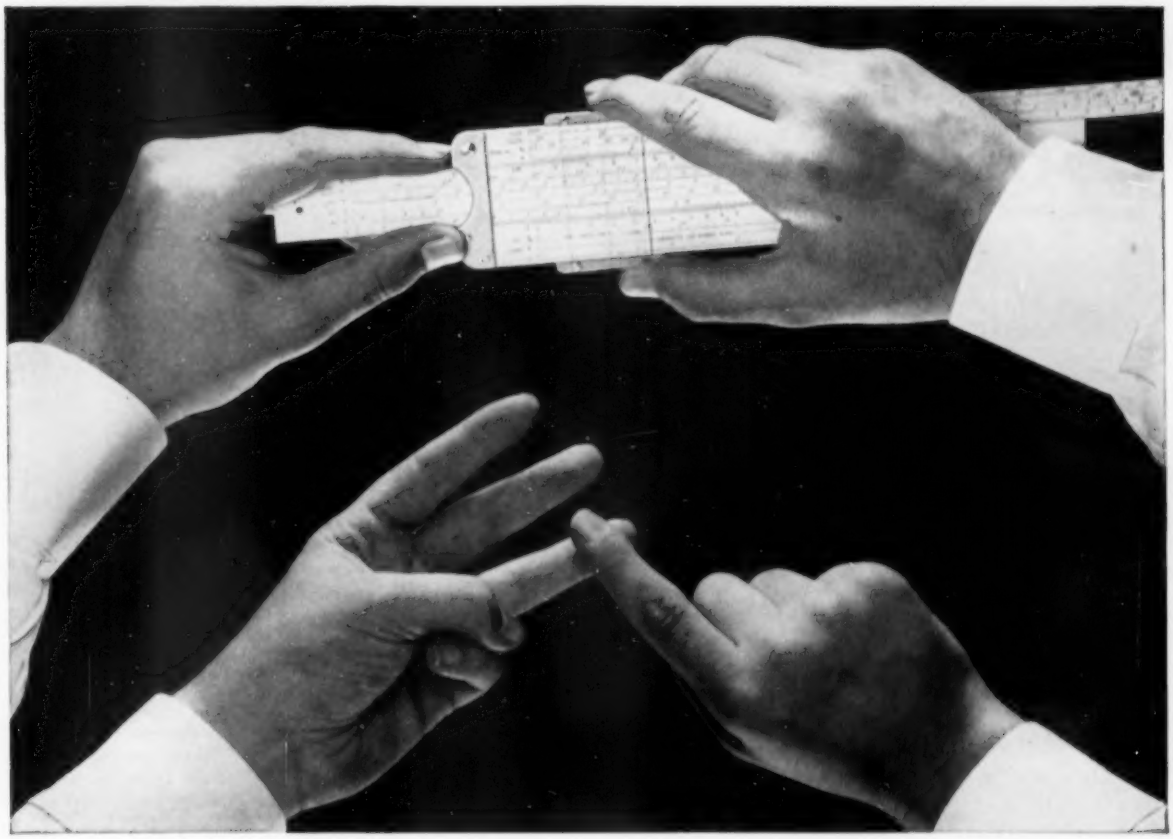
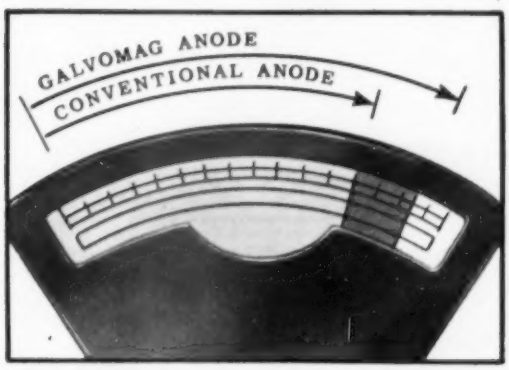
Any way you figure it . . .

DOW



GALVOMAG anodes are your best buy



25% more current output. GALVOMAG high-potential anodes generate more current—assure protection in high-resistivity soils.

Whether you use an engineer's slide rule or count on your fingers, GALVOMAG* high-potential anodes give you more cathodic protection for your dollar. Take our word for it, or do the mathematics yourself. Either way you get an answer that means less cost with GALVOMAG anodes.

Take high-resistivity soils. GALVOMAG anodes have 25% higher potential than ordinary anodes—give you that extra punch you need without installing extra anodes.

Take average soils. 4 GALVOMAG anodes will do the work of 5 ordinary anodes. Fewer holes are needed so you save 20% on installation costs.

Your Dow anode distributor can translate the advantages of GALVOMAG anodes into dollar and cents savings for your specific application. Call him today. THE DOW CHEMICAL COMPANY, Dept. MA 378R-1, Midland, Michigan.

*Trademark of The Dow Chemical Company

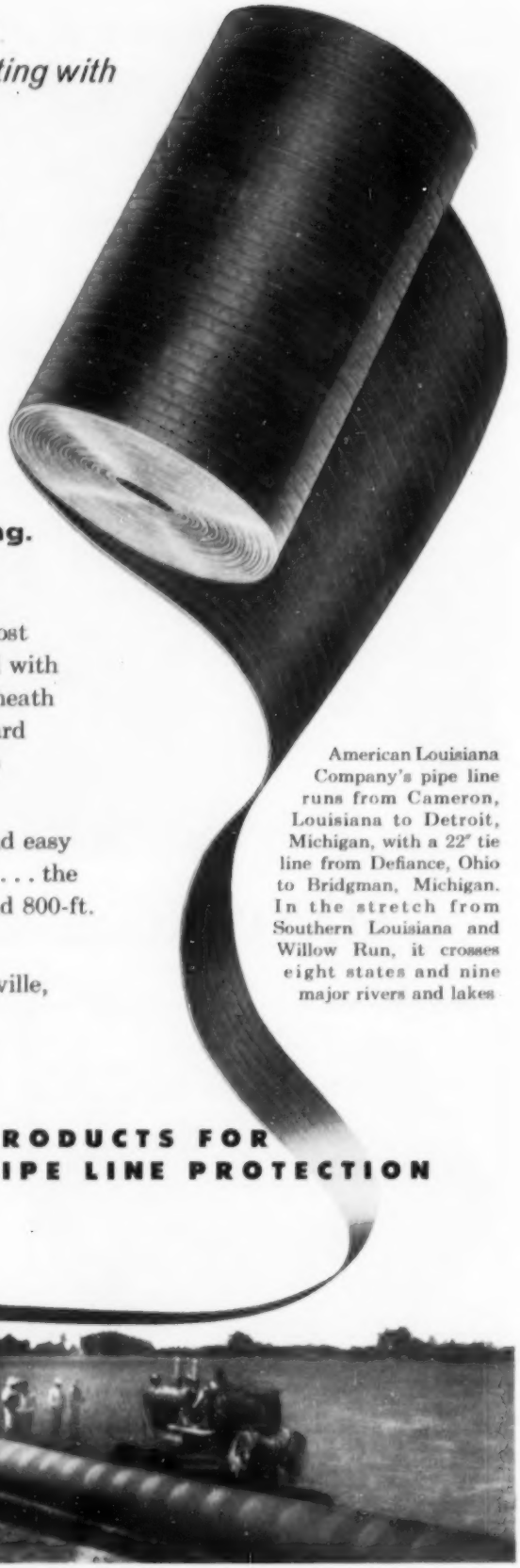
CALL THE DISTRIBUTOR NEAREST YOU: CATHODIC PROTECTION SERVICE, Houston, Texas • CORROSION SERVICES, INC., Tulsa, Oklahoma • ELECTRO RUST-PROOFING CORP. (Service Division), Belleville, N.J. • ETS-HOKIN & GALVAN, San Francisco, Calif. • ROYSTON LABORATORIES, INC., Blawnox, Penna. • STUART STEEL PROTECTION CORP., Plainfield, N.J. • THE VANODE CO., Pasadena, Calif.

you can depend on DOW MAGNESIUM ANODES DOW

American Louisiana Pipe Line protects approximately 600 miles of its pipe coating with

Johns-Manville Transhield®

Asbestos Pipe Line Felt



Permits high-speed wrapping... assures effective protection for coating.

Transhield gives high value for a reasonable cost . . . made of tough, long-life asbestos reinforced with parallel glass yarns . . . it forms a continuous sheath between the enamel coating and the soil to guard against soil stress and give long life to the pipe line coating.

Contractors like Transhield's light weight and easy application . . . it speeds up coating operations . . . the high tear strength (a knife is used to cut it) and 800-ft. rolls lower construction costs.

For further information write to Johns-Manville, Box 14, New York 16, N.Y.; in Canada, 565 Lakeshore Road East, Port Credit, Ontario.

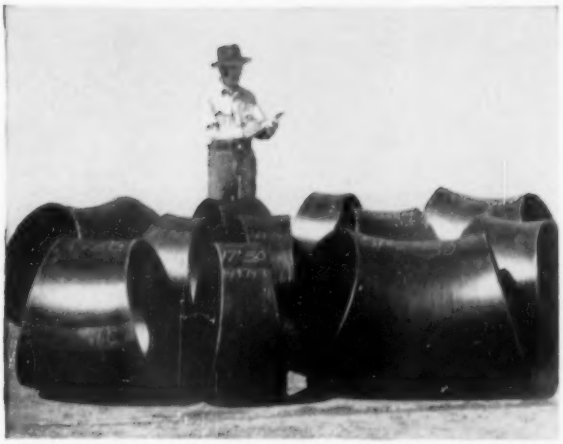
American Louisiana Company's pipe line runs from Cameron, Louisiana to Detroit, Michigan, with a 22" tie line from Defiance, Ohio to Bridgman, Michigan. In the stretch from Southern Louisiana and Willow Run, it crosses eight states and nine major rivers and lakes

Johns-Manville PRODUCTS FOR PIPE LINE PROTECTION

Speed up the job with

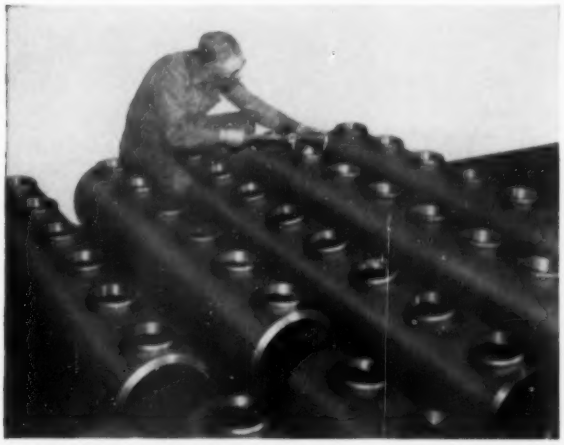
TUBE-TURN®

welding fittings and flanges



ANY ANGLE! Tube Turns can supply you with pipe line elbows not only in 45° and 90° types but in odd angles . . . sizes as large as 42". Specify TUBE-TURN® Welding Fittings and save valuable time in the field.

COST REDUCERS. On Transcontinental line, TUBE-TURN Venturi Reducers minimize cost of valves and scraper traps. Reducers shown are 36" x 30". Courtesy Transcontinental Gas Pipe Line Corporation.



SIMPLIFIES CONSTRUCTION. You can get TUBE-TURN Manifold Welding Fittings with size, wall thickness and number of outlets as required by your job. Reduces costs for many types of service. Easy to install.

FOR "HOT TAPS." Strong, safe "hot tap" connections are made possible by the TUBE-TURN Full Encirclement Saddle. Fully meets all requirements for reinforcement of welded branch connections.

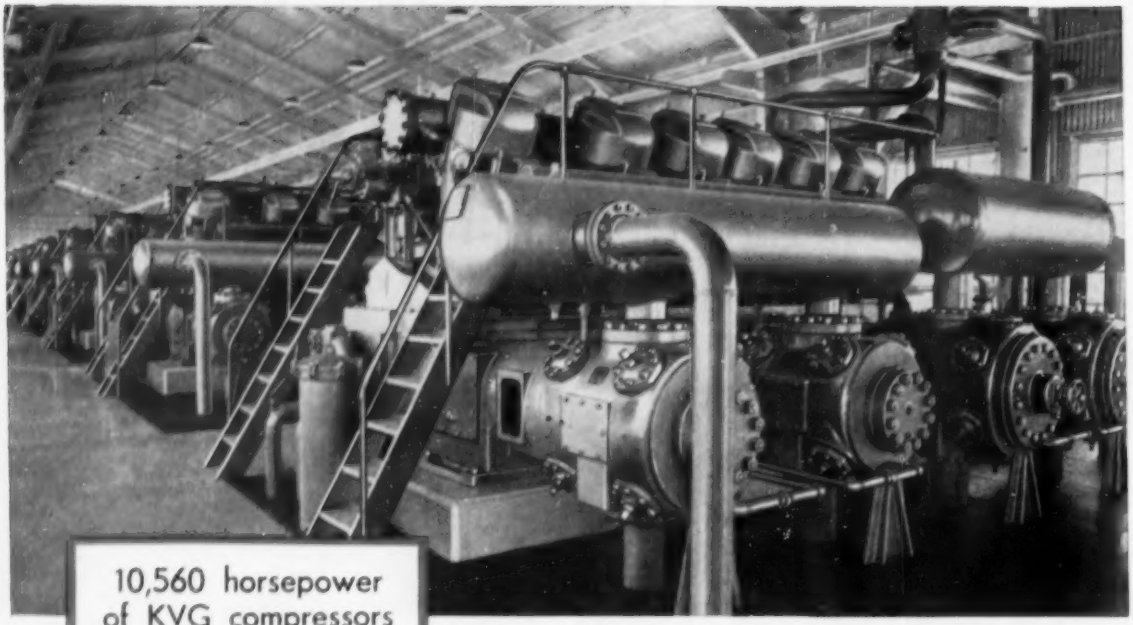
TUBE-TURN Welding Fittings and Flanges are made in U.S.A.
They meet all U.S. piping code specifications

®"TUBE-TURN" and "tt"
Reg. U.S. Pat. Off.

TUBE TURNS LOUISVILLE 1, KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago • Kansas City • Denver
Los Angeles • San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas



10,560 horsepower of KVG compressors at Permian Basin Pipeline Company

These eight Ingersoll-Rand KVG gas-engine compressors provide a total of 10,560 horsepower for a gas compression station of the Permian Basin Pipeline Co., a subsidiary of Northern Natural Gas Company. Each machine consists of a 12-cylinder, V-type, four-cycle gas engine with four compressor cylinders mounted on the same frame and driven from a common shaft.

On any service

I-R Gas-Engine Compressors

offer two basic advantages

Wide load fluctuations are unavoidable in many compressor applications. That's why the *flexibility* of **I-R FOUR CYCLE** gas-engine compressors is a big asset. They always deliver smooth, steady power all the way from no load to full load and at any speed from half to full rated rpm.

The second basic advantage is in the *compressor end.* Here the extra dependability and the trouble-free performance of **I-R** job-engineered cylinders and valves add up to exceptionally low maintenance expense. This has been proven repeatedly in hundreds of installations covering all types of air and gas compression requirements.

Ingersoll-Rand four-cycle gas-engine compressors are available in sizes from 110 to 2000 horsepower. Call in your **I-R** representative when planning your next installation. His experience can save you time, effort and expense all along the line.

Ingersoll-Rand

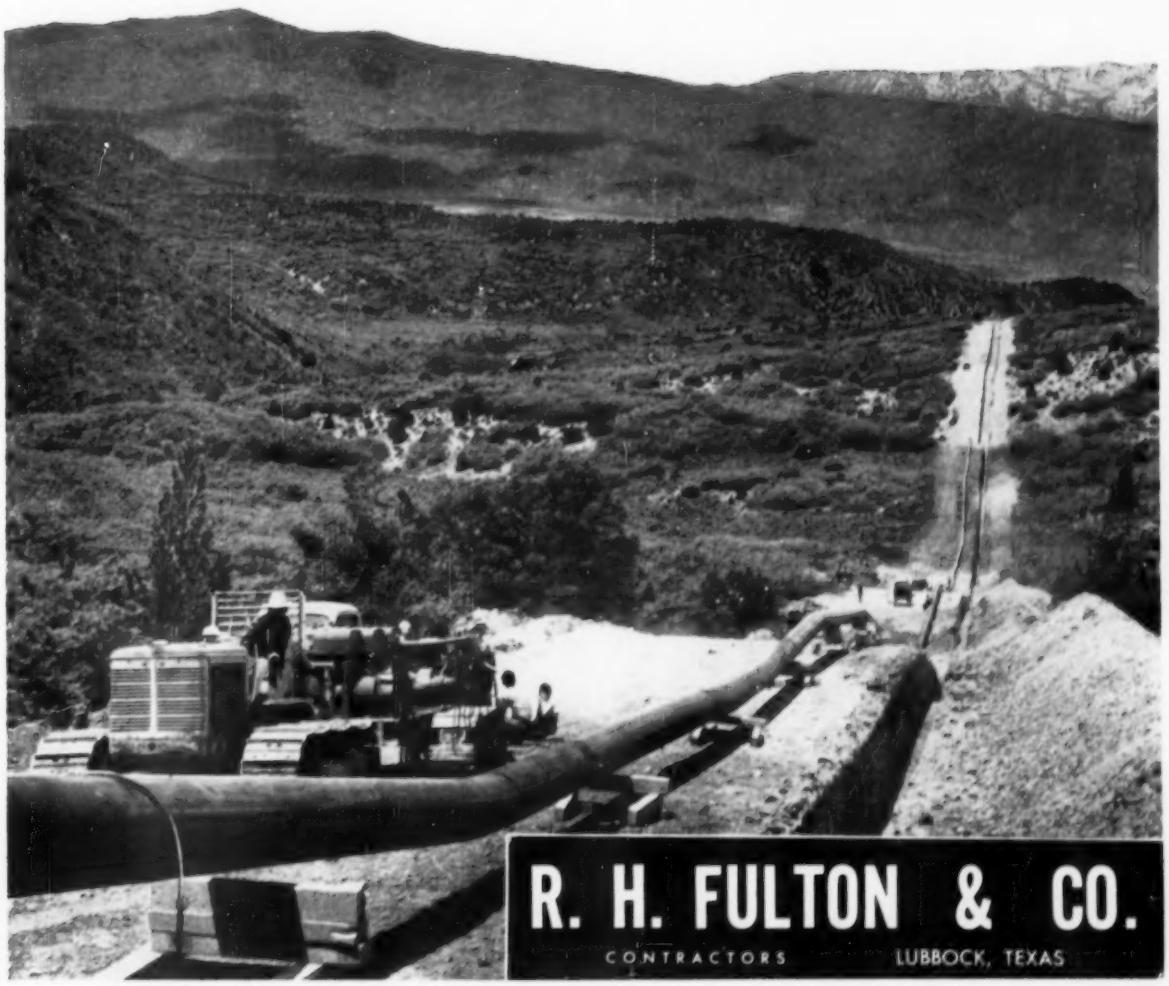
6-267 11 BROADWAY, NEW YORK 4, N. Y.

4 CYCLE V

PIPELINES

ACROSS THE CONTINENT...

OIL LINES
WATER PIPELINES
RIVER CROSSINGS
PRODUCTS PIPELINES
GAS PIPELINE CONSTRUCTION



mile after mile of MIDWESTERN *Service*

Owens - Corning FIBERGLAS Underground Pipewrap

The Midwestern-Owens-Corning "team" furnished *all* the underground glass pipe wrap used on the great American-Louisiana line.

Reaching far ahead of all other glass wraps in tensile and tear strength, Owens-Corning Coromat goes on faster and lasts longer—providing maximum economy in application and maintenance.

OWENS-CORNING FIBERGLAS

with Keystone Asbestos Felt

150,000 squares of Keystone Asbestos Felt were provided for the American-Louisiana line by Midwestern—adding another to the long history of successful installations to its credit.

Applied at high speeds with less breakage and fewer holidays, Keystone provides a continuous asbestos shield—cools and bonds as it is applied—becomes an integral part of the coating.

Midwestern sales and service representatives are as close as your telephone—offering complete service on all types of pipe line supplies and equipment. Take advantage of their background and experience for *your* pipe line requirements.

MIDWESTERN PIPE LINE PRODUCTS CO.

P. O. 1886, Tulsa, Oklahoma • Hickory 6-6144

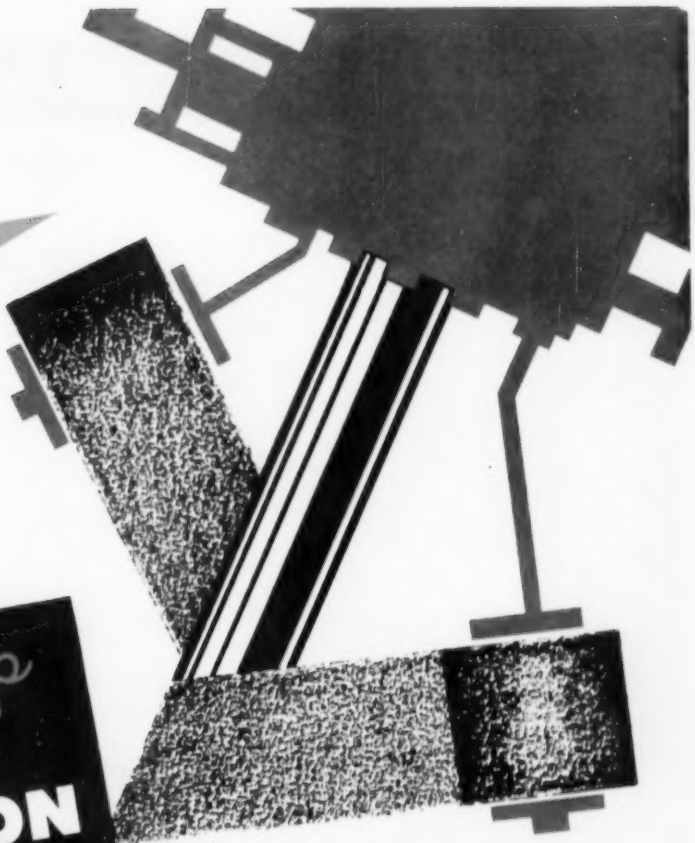
Always SPECIFY

KERMAC

pipeline Outerwrap

PROVEN POSITIVE

PROTECTION FOR PIPELINES



- fewer breaks
- fewer holidays
- maximum strength

• HIGH MOISTURE RESISTANCE

Kermac pipeline outerwrap fabrication will not draw moisture into the coating or wick out light bitumen fractions; allows full utilization of protective enamels.

• HIGH HEAT RESISTANCE

Withstands storage and handling up to 150° F. Tests prove satisfactory applications with enamel temperatures as high as 500° F. Mica flaked surface reflects sun, heat; lets enamel set up hard, even in hottest weather.

• MAXIMUM STRENGTH

Longitudinal reinforcement with strong glass yarns, give extra strength to Kermac bonded fibrous glass mat, corrosion resistant construction. Exceptional tear and breaking strength, means more protection in backfill operations.

• SMOOTH FLEXIBILITY

Kermac outerwrap conforms easily, fits tightly on sags and bends. No need for extra precautions against breaks or holidays.

• COLD RESISTANCE

Kermac outerwrap can also be handled and stored satisfactorily at temperatures as low as 0° F. It will not crack even when applied during zero weather **AND . . .**

• PERFECT POROSITY

Kermac outerwrap permits complete release of trapped gasses and allows sufficient penetration of hot enamel to harden into complete locking keys between the outerwrap and enamel coating.

KERMAC

A PRODUCT OF

KERR-McGEE OIL INDUSTRIES, INC.

306 N. ROBINSON • OKLAHOMA CITY, OKLA.

PIPELINE News from L·O·F GLASS FIBERS COMPANY

BLUE FLAG PROTECTS TIDELANDS PIPELINE!

The ground was so wet that water had to be pumped constantly from the ditch by the well point system shown here. ▶

City engineers of Anacortes, Washington, were faced with the problem of laying over 24,000 feet of large-diameter water pipeline—most of it through wet and muddy tidelands, an extremely corrosive environment!

To assure complete protection, Engineers Carey and Kramer specified L·O·F Glass Fibers' Blue Flag reinforcing inner wrap for the pipe, which was wrapped by American Pipe and Construction Co., Portland, Oregon.

Blue Flag pipe wrap is made of special inert glass, which resists the action of soil chemicals. The strong, uniformly porous mat acts to give you:

- increased enamel strength
- high resistance to cracking and backfill damage
- improved enamel distribution with far fewer "holidays"
- years more pipeline life

. . . all this for less than ½% of your original pipeline investment. Be sure to specify Blue Flag for your over-the-ditch or yard-wrapped pipe. It's available from strategically located distributor warehouses. For full details, write: L·O·F Glass Fibers Company, Dept. 74-106, 1810 Madison Avenue, Toledo 1, Ohio.

LOF GLASS FIBERS
BLUE FLAG PIPE WRAP

L·O·F GLASS FIBERS COMPANY

TOLEDO 1, OHIO

Makers of glass fibers by the "Electronic-Extrusion" process

A Complete Line for Pipeline Protection: BLUE FLAG Reinforcing Pipe Wrap • **DURAMAT** Protective Outer Wrap • **DURAMESH** Pipeline Fabric • **DURATAPE** Pipeline Joint Wrap

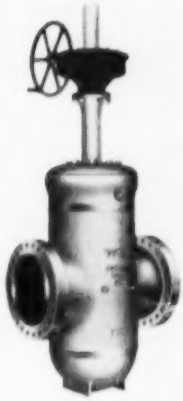
W-K-M VALVES
Smooth the way on the "Muskrat Line"

Two hundred million cubic feet of gas per day will flow smoothly through TGT's 355-mile "Muskrat Line." There'll be no turbulence — no restriction to flow set up by the mainline valves, because they are W-K-M Through-Conduit Parallel Expanding Gate Valves. These efficient valves assure full volume — smooth flow — all the way. Scrapers will go through them as easily as they do through the pipe.

The through-conduit design provides a valve bore the same I.D. as the pipe. The parallel expanding gate with LEVERLOCK* operation provides positive, easy opening and closing; upstream and downstream sealing; no surge closing. W-K-M Valves can be repaired, and seats replaced, if ever necessary, without removal from the line.

For proved performance and minimum maintenance, specify W-K-M Pipeline Valves. Ask your W-K-M Representative or write today for new Pipeline Valve Catalog #300.

*Trade Mark of W-K-M Manufacturing Company, Inc. 5616



W-K-M MANUFACTURING COMPANY, INC.

A SUBSIDIARY OF OCf INDUSTRIES INCORPORATED

PLANT: MISSOURI CITY, TEXAS • MAILING ADDRESS: P. O. BOX 2117, HOUSTON, TEXAS

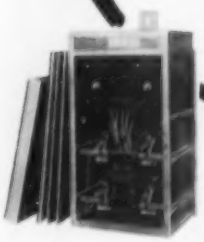
MANUFACTURERS OF

W-K-M	OCf	KEY
THROUGH-CONDUIT GATE VALVES	LUBRICATED PLUG VALVES	RETURN BENDS AND FITTINGS

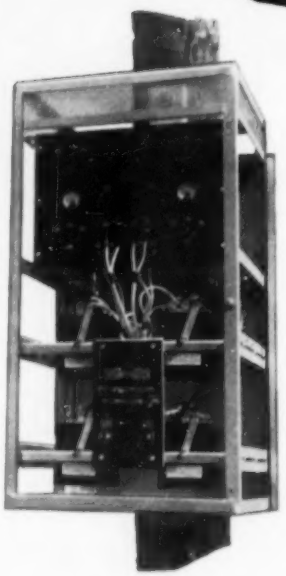
Good-All

Moves Ahead with its 1957 "Functional Design"

CATHODIC PROTECTION RECTIFIERS



New, "*Speed-up*" Features Reduce Installation and Service Time!



STEEL FRAME carries stacks, wiring, controls and panels . . . bolted in . . . ready for installation. Top, door and sides are attached separately to the frame. Takes less than 5 minutes to remove and re-assemble.

HEAVY DUTY POLE BRACKET with hoist holes makes it easy to pull rectifier up to desired height and secure to pole. Bracket can be converted to cross arm mounting with the addition of an available accessory.

NEW ACCESSIBILITY. Open from top and 3 sides for easy access to all components without removing from pole.

STREAMLINED TOP AND SIDES fit together like a glove—provide excellent weather protection. Streamlined design and modern appearance make it highly acceptable in urban construction.

NEW EASE OF SERVICING All connections are accessible by front panel board. For safety, all input voltage changes are quickly accessible by simply removing the right side panel.

New Mechanical Features Give Greater Dependability, Life and Performance

NEW stronger front panel of Phenolic and Steel. Closer Design • NEW exclusive transformer insulation, windings, materials and methods protect leads and wiring—eliminate, entirely the possibility of short circuit . . . improves the regulation of the transformer. • NEW D.C. Lifetime Terminal Lugs. • NEW Transformer Designs tailored to specific Cathodic Protection conditions.

Write, wire or phone for complete details and prices.

Dept. 22-K

Stop Dangerous Corrosion

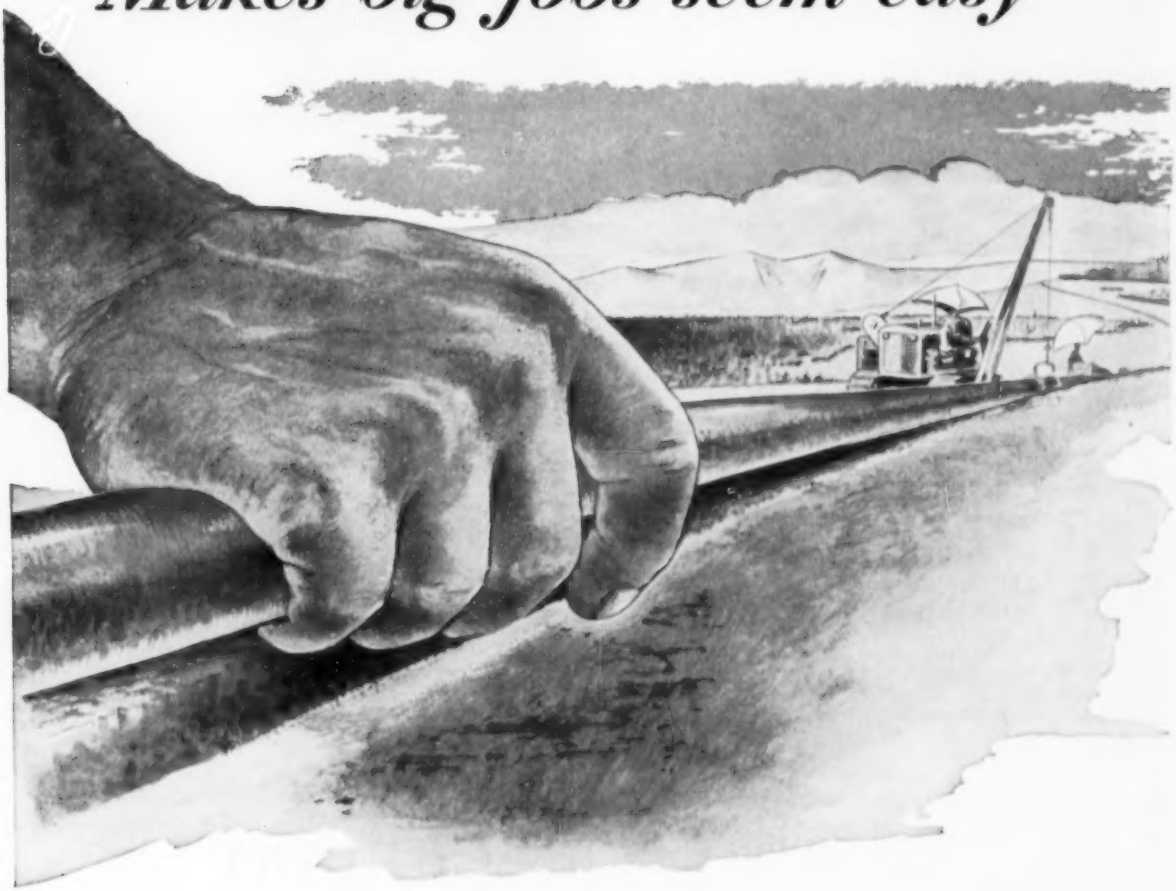
. . with this number one rectifier in the field. Now you get continuous, trouble-free protection at costs that are lower than ever before possible.

Individually engineered to fit your particular requirements. Prompt engineering service. There's a Good-All Rectifier for every Cathodic Protection requirement.

GA GOOD-ALL ELECTRIC MFG. CO. Electrical-Mechanical Division OGALLALA, NEBRASKA

River

Makes big jobs seem easy



It takes planning, equipment and trained crews to complete pipeline contracts ahead of schedule. It takes the experience gained in the thousands of miles of pipeline that River has finished to overcome the obstacles of terrain and weather and come out ahead. Put River Construction to work on your next contract and watch the job completed... to your satisfaction — *on time!* River is just the right size... big enough to handle any job... small enough to give your contract the personal attention it deserves.

River CONSTRUCTION CORPORATION

ROBERT THOMAS
J. C. BRISCOE
J. C. MINYARD

GENERAL OFFICES: 4837 WEST FREEWAY.

P. O. BOX 9127, FORT WORTH, TEXAS

Houston Contracting crews tieing-in 30" pipe on American Louisiana line.

HOUSTON CONTRACTING COMPANY

LAYS 372 MILES OF 30 INCH FOR AMERICAN LOUISIANA PIPELINE

Houston Contracting Company is proud of working with American Louisiana Pipeline Company on the big new Gulf-to-Great Lakes line. Three spreads were operated by Houston Contracting on the 130 million dollar project, which will bring gas from the Gulf of Mexico to Michigan and other parts of the Great Lakes area.

Experience like this—gained from work on many of America's major pipeline construction jobs—is your assurance of a job well done.

HOUSTON
CONTRACTING COMPANY
General Contractors
OIL • GAS • GASOLINE • WATER PIPE LINES
Laurence H. Favrot • R. P. Gregory • Geo. A. Peterkin
2707 FERNDALE, HOUSTON 6, TEXAS

got

PRESSURE RELIEF VALVES

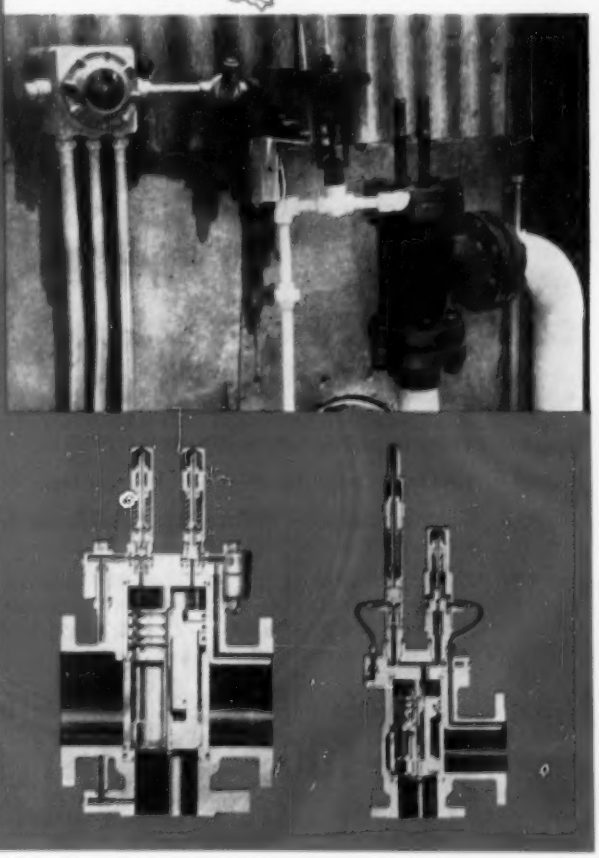
Performing THREE VITAL FUNCTIONS at every American-Louisiana Station

Selected because of their **proved dependability** in similar service on other systems, Garrett Relief Valves are used **exclusively** by American-Louisiana Pipe Line Company to protect compressors and yard piping at each of three stations now in operation. **And Garrett Valves will be used exclusively for the same purposes at additional stations now under construction!**

In the American-Louisiana system, each Garrett Valve performs **three** functions, serving (1) for relief of excess pressure on compressor discharge headers; (2) as a remote controlled purge valve and (3) for remote controlled, push-button safety shutdown. As an extra safety feature, each valve is equipped for manual blowdown in event of power failure.

American-Louisiana Pipe Line Company and Brown and Root, Inc., who designed and constructed this great transmission system, are to be congratulated. The facilities represent the most modern concept of pipe line construction and operation, and we are proud to be a part of it.

We'd be proud, also, of an opportunity to furnish Garrett Relief Valves for **your** transmission and distribution systems. Sizes from 1" through 8", screwed or flanged, single or dual outlets, for liquid or gas service at 25 psi to 5000 psi. For detailed information, write for Catalog No. 556 RV.



REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE UNITED STATES AND ABROAD

Garrett Oil Tools, Inc.

P. O. BOX 2427 • LONGVIEW, TEXAS

USI

DIVISION OF U. S. INDUSTRIES, INC.
New York, N. Y.

Sales of LPG hit 6.2-billion gal. mark in 1955

TRENDS IN THE SALE OF L.P. GASES BY PRINCIPAL USES

(Thousands of gallons)

Year	Domestic and Commercial	Chemical	Synthetic Rubber	Internal Combustion	Industrial	Gas Manufacturing	Other	Total
1951	2,166,813	844,507	374,864	289,991	262,102	281,692	7,306	4,227,275
1952	2,266,178	870,990	370,997	370,558	324,967	259,697	13,992	4,477,379
1953	2,479,180	967,427	390,501	498,238	348,517	222,430	25,716	4,932,009
1954	2,626,808	1,050,239	307,735	547,204	375,121	191,932	26,494	5,125,533
1955	2,801,379	1,366,942	406,210	651,821	524,464	213,760	31,907	5,996,483

King GAS SEPARATOR-SCRUBBERS

TYPICAL INSTALLATION OF KING GAS SEPARATOR-SCRUBBERS AS USED THROUGHOUT AMERICAN LOUISIANA PIPE LINE COMPANY'S SYSTEM

** A revolutionary design in oil-bath scrubbers that provides capacities up to 300 MMSCFD

** Reduced pressure drop and less oil loss

** Greater capacity reduces size and number of units required for a specific flow

** Equipped with a highly efficient separator section for liquid removal, that also serves as a means of protecting the scrubber's oil-bath when alternate wet and dry gas conditions are encountered

FOR ADDITIONAL DATA, WIRE—WRITE—PHONE

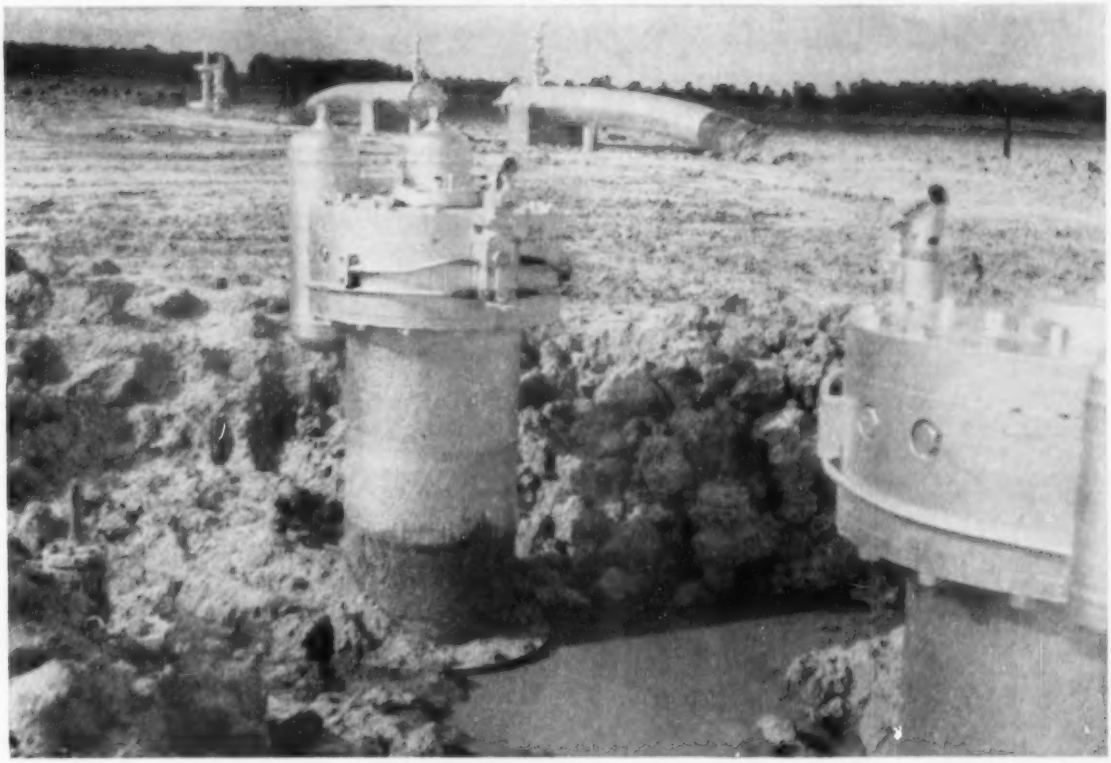
KING TOOL COMPANY, LTD.

LONGVIEW, TEXAS BOX 2269 PLAZA 9-4301

FOR the 34th consecutive year, LPG sales in 1955 again increased, according to the annual Bureau of Mines report. The final figure of 6.2 billion gal. was up 17 per cent over 1954—and the gallonage gain of 884.4 million was the largest increase in volume ever recorded by this industry. Every division scored significant advances, with synthetic rubber and gas manufacturing uses reversing the downward trends noted in 1954.

In 1955, for the first time, reporting companies were asked to show liquefied refinery (LR) gases as a separate item under industrial uses. Coverage was also expanded to include iso-butane, ethane, and methane-ethane mixtures used in chemical plants as raw materials. These fuels were used but apparently not reported in previous years. The shift of synthetic rubber plants to private ownership with an extensive up-grading in plant facilities and marketing methods has done much to insure more stability to this industry as an LPG consumer.

Domestic and commercial uses reflected the continuing strength of the major LPG market, the domestic consumer, accounting for 46.7 per cent of total sales with a 7 per cent increase in volume over 1954. Greatest percentage gains in this market over 1954 were recorded in Nevada (35 per cent), Idaho (26 per cent), Pennsylvania (23 per cent), Tennessee (21 per cent), Arizona (19 per cent), and Iowa (16 per cent). Largest gallonage gains were in Illinois (12.3 million), Texas (12.1 million), Florida (11.9 million), and Iowa (10.9 million). The California loss of 1.6 million gal. in this category during the past year, because of the natu-



All Valves on American-Louisiana's 30" Line were COLD-COATED with ROSKOTE

Every valve on this 1000 miles of 30" pipe — all WKM's and WALWORTH's—is coated with Roskote cold-applied pipe mastic for lasting protection in all kinds of underground conditions from North Tepetate, Louisiana to Willow Run, Michigan.

Jointly approved for use by American Louisiana Pipeline Company and their engineers, Ford, Bacon & Davis, Roskote was, in addition, used for some of the line patching where the original coating was imperfect or damaged. Two coats of Roskote were used, either by brush or pressure pump spray, and jeeped by the holiday detectors used on the line.

All three contractors, Houston Contracting Company, Brown & Root, Inc. and H. C. Price Company used Roskote on the project.

Because of their easy, non-toxic application by brush, spray or Roskoter coating device, their extremely fast drying and their proven high electrical resistivity, Roskote pipe mastics have been specified by more than 400 gas, oil and pipeline companies for lasting protection of their gas, oil and product pipelines.

For literature covering Roskote physical properties, application instructions and complete test data, write to Royston Laboratories or their nearest district office or distributor.

Standing in water-laden backfill, the Shafer-operated valves seen in the photograph above are given lasting, jeep-proven protection by below-ground coating of Roskote 612XM Pipe Mastic.

ROYSTON LABORATORIES, Inc., Box 112-B, Blawnox, PITTSBURGH 38, PA.

District Sales Offices:

P. O. Box 1084, Atlanta, Georgia
P. O. Box 1753, Tulsa, Oklahoma
P. O. Box 2511, Monroe, Louisiana
P. O. Box 21, Park Forest (Chicago), Ill.
3114 Midvale Avenue, Philadelphia 29, Pa.

Distributors: Overton Sales Equipment Co., 5981 Fairmount Extension, San Diego 20, Calif. — Hugh Brightwell, 4101 San Jacinto, Houston 4, Texas

Manufacturers Of: Roskote Pipe Mastics • Roylac Aluminum Finish • Oil and Gasoline Resistant Mastics • Vinachrome Primer • Orco Insulation Tape • Roybond A-36 Adhesive • Aluminum Mastic • Pipe Storage Primers • Roskoter Coating Device • Royston Glass Wrap • Endseals

Distributors Of: Polyken Tape • Dow Magnesium Anodes • Pipeline Felt • Glass Pipe Wrap • Pipeline Padding

Warehoused in North East, South East, South Central and North Central Regions

SAFETY PAYOFF

IN PIPELINE CONSTRUCTION:

an accident rate 1/6th that of the industry average.

On H. C. Price Co.'s five pipeline construction spreads, the work of full-time safety engineers has helped net provable results . . . a record which boasts an accident rate kept to less than 1/6th that of the industry average!

These results are included in two new Awards for Safety presented H. C. PRICE CO. by the *Joseph A. Holmes Safety Association.**

TO: H. C. PRICE CO.
BARTLESVILLE, OKLAHOMA

"for the outstanding frequency rate of 7.4 from December 1, 1954 to November 30, 1955, in pipeline construction against a national average of 46.2."

AND TO: R. L. EZELL,
SPREAD SUPERINTENDENT
H. C. Price Co.

"for having no lost-time accidents to the men under his supervision, from November 20, 1953, to November 30, 1955, and continuing, a total of 935,110 man-hours—a record in pipeline construction."

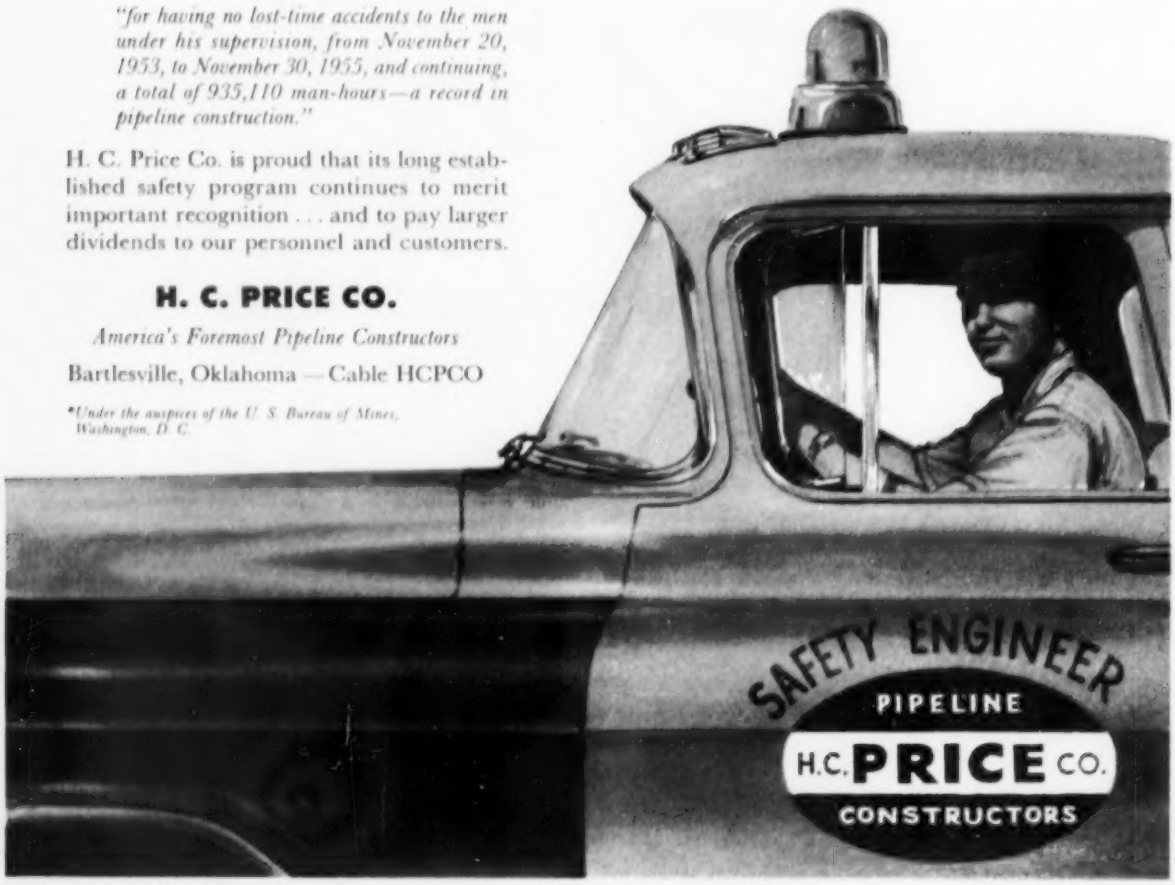
H. C. Price Co. is proud that its long established safety program continues to merit important recognition . . . and to pay larger dividends to our personnel and customers.

H. C. PRICE CO.

America's Foremost Pipeline Constructors

Bartlesville, Oklahoma — Cable HCPCO

**Under the auspices of the U. S. Bureau of Mines, Washington, D. C.*



GAS pipeline news

ral gas system expansions, was more than offset by a gain in the state of 10.5 million gal. in sales for internal combustion usage.

Engine fuel uses jumped 104.6 million gal. in 1955; 19 per cent above the 1954 total of 547.2 million gal. The growing volume of successful LPG performance records now becoming available from municipal bus, materials handling, motor freight, taxi, and agricultural equipment fleets will tend to accelerate this trend in the next few years. Another boost will be afforded by the new highway-use and fuel taxes enacted to support the federal highway construction program. Truck operators, already squeezed by operating costs, will give increased attention to the savings possible from LPG engines and conversions.

Below-average gains in domestic and commercial LPG sales in most of the Great Plains States for 1955 can be attributed to a combination of reduced prices for marketed farm products and drought. The more favorable economical outlook in this area for 1956, and increased LPG production in the Williston basin should return these states to near-normal gains for the current year. ■

Producer wants to end interstate gas sale

An independent producer has asked the FPC for permission to abandon a sale being made to United Gas Pipe Line Co. so that he can sell the gas intrastate, and can carry out a contract commitment made in 1951.

P. R. Rutherford, the applicant, states that his contract with United, executed in 1946, relating to sales from leases in Huff and Fagan fields in Refugio county, Texas provides that it shall be effective for 10 years and continue in effect thereafter for successive periods of one year each, but that either party may terminate the contract at the end of the original term or any succeeding annual period by giving 90 days' notice.

Rutherford entered into an agreement with Industrial Gas Supply Corp. and Ship Channel Industrial Gas Corp. on April 4, 1951, obligating the producer to sell and deliver to Industrial, located in Texas, all merchantable gas produced from all wells on lands described in Refugio county not covered by the United contract and, subject to the United contract, all gas produced from the lands covered by the United contract. The 1951 agreement also contains an express representation by sellers, the application says, that they will terminate the United contract pursuant to the terms on Aug. 15, 1956, when the 10-year period of the contract ended.

HERE'S NEW ECONOMY, DEPENDABILITY AND

SUPERIOR CONCRETE COATING by ANCHOR-WATE, Inc.

Half a Million Feet of Concrete Coating In Our First Year!

Here are pictures taken on an Anchor-Wate, Inc., job for a major company. If you have a concrete coating or "weight" problem, write, wire or phone Anchor-Wate, Inc.

We now have a permanent yard and office at Bourg, La., for barge loading and unloading and for pipe storage and yard coating. We invite your inquiries.

ANCHOR WATE INC.

P. O. Box 12185 — Phone MI 9-2769 — 10410 Telephone Road — Houston 17, Texas

Anchor-Wate, Ltd., 4816 McCleod, Calgary, Alberta, Canada • Phone 3-3157

Columbia reorganization plan goes into effect

The first step in the proposed plan for realignment of Columbia Gas System's natural gas properties has gone into effect with the issuance of certificates by an FPC presiding examiner (Docket G-9689, et al).

The decision grants three applications by five existing Columbia subsidiaries and one proposed new subsidiary. One application was filed jointly by Central Kentucky Natural Gas Co., United Fuel Gas Co., and Kentucky Gas Transmission Corp. The latter company, newly organized, would become a wholly owned subsidiary of the Columbia System upon final consummation of the transactions proposed in the joint application.

One of the other two applications was filed jointly by the Manufacturers Light & Heat Co. and Natural Gas Co. of West Virginia, both of Pittsburgh; the third application is a joint endeavor under which Natural will be merged into Ohio Fuel Gas Co., Columbus.

In the realignment plan, it is proposed to create one interstate transmission company selling gas at wholesale and operating all properties subject to FPC regulation, and one retail distribution company to serve in each state and subject to the jurisdiction of only one state regulatory office.

In the three-way application, Kentucky Gas Transmission plans to acquire all of the interstate facilities of Central Kentucky, all located in Kentucky. United Fuel then would sell gas at wholesale to the transmission company, which in turn would sell gas to Central Kentucky and several non-affiliated companies. Presiding Examiner Emery Woodall said these transactions would separate business subject to state commission jurisdiction from that subject to the jurisdiction of the FPC, a separation which it is hoped can ultimately be effected throughout the Columbia System.

The two other joint applications which were approved by the presiding examiner involve the proposed acquisition by Manufacturers of part of Natural's facilities, with Ohio Fuel acquiring all remaining facilities of Natural which either are not sold to Manufacturers or are abandoned. Natural would be merged into Ohio Fuel. All of Natural's facilities are located in northeastern Ohio, and service now being rendered by Natural would be continued by Ohio Fuel and Manufacturers. The presiding examiner said that the transactions proposed in these two applications are part of a long series of steps which have been proceeding for a number of years in a general effort to reduce the number of operating companies serving Columbia System customers and thus simplify the system's operations by reducing bookkeeping costs, eliminating intercompany transactions, and thus reducing the number of regulatory relations.

Interruptible sale okayed despite opposition

Transcontinental Gas Pipe Line Corp., Houston, has been granted a certificate by an FPC presiding examiner for the sale of an additional 1.5 MMcf/day of gas on an interruptible basis to Owens-Corning Fiberglas Corp. at its Anderson, S. C. plant. Transco

MOORLANE

GAS SCRUBBERS

AN ESSENTIAL ACCESSORY

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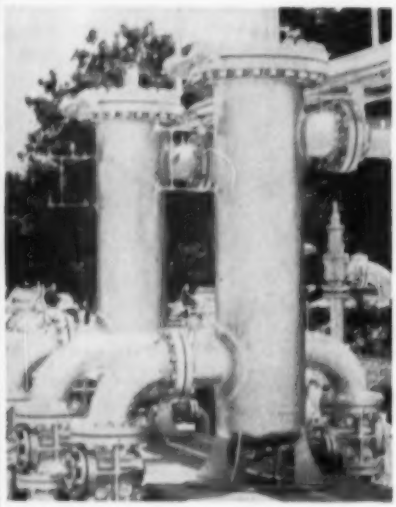

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ents and Markers are frequently supplied for "Oil" and "Products" lines. *Photograph by permission of representative customers.*

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Fleet-Line Vents and Markers are a sound investment in good public relations. They truly dress up your pipe line.

Yet they are relatively inexpensive. The Vents are priced to compete with those commonly fabricated from pipe.

Your company emblem, name or initials can be cast integral. An interchangeable brass plate on the reverse side can be used for mile-post and other data.

Painted in your company colors, or unpainted.

Standard sizes for slip-fit on pipe: Vents 4", 3", and 2"; Markers 2".

Supplied for solid fillet weld, or with countersunk Allen head screws.

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Patented. Trade Mark Registered U.S. Patent Office.

Back views of Vent and Marker show location of brass identification plate.

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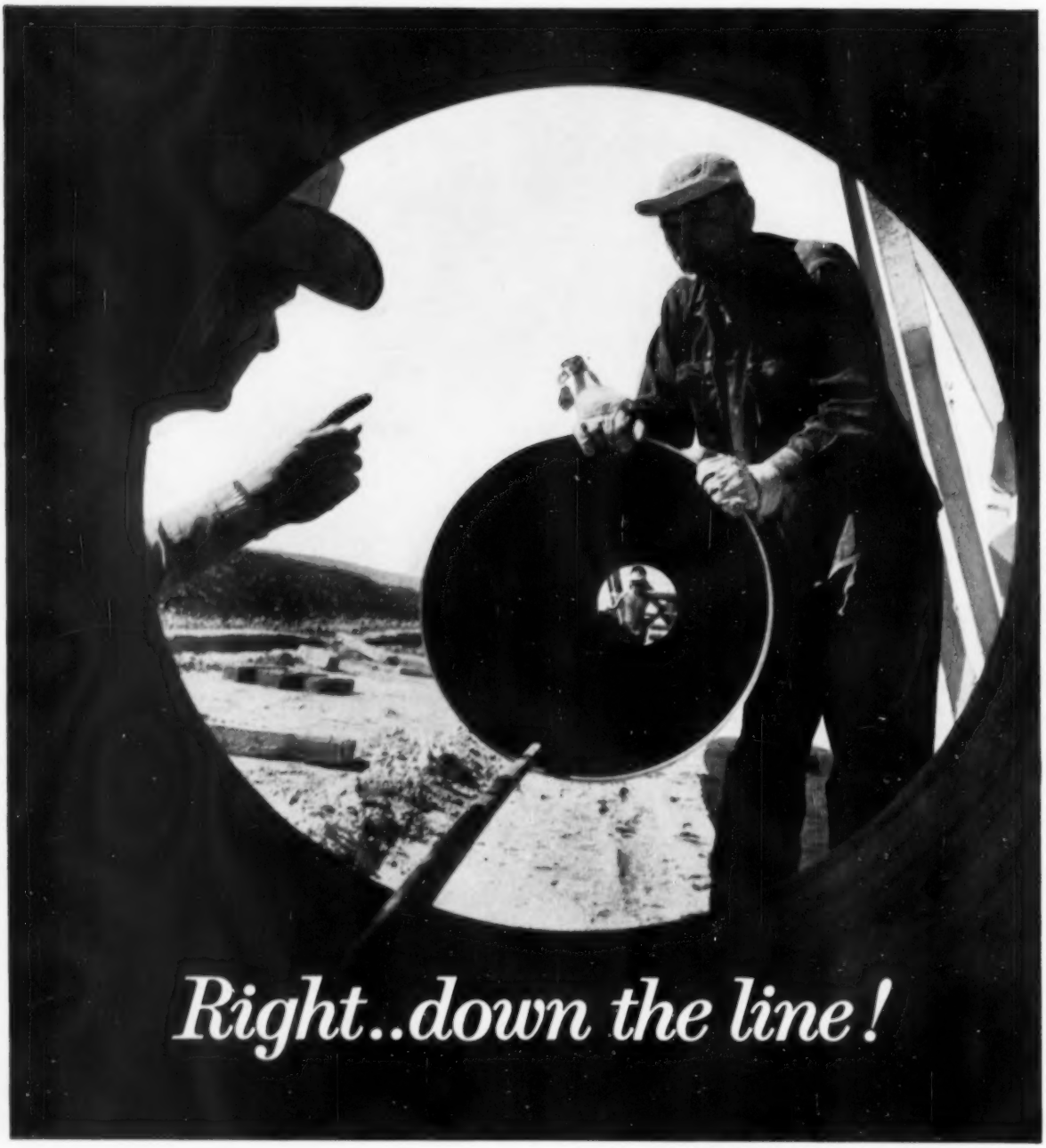

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Quality, uniformity, precision—these are watchwords that you can always depend on when you use Kaiser Steel Line Pipe.

For example, Kaiser Steel Line Pipe—20 inch OD and larger—is placed in restraining dies and expanded by water under great pressure. This hydraulic expansion assures accurate diameter, concentricity and straightness—and also strengthens the pipe through additional cold working. Another example of the painstaking care that goes into the manufacture of pipe from Kaiser Steel.

Next time you are ordering line pipe, specify Kaiser Steel Line Pipe. Rely on Kaiser Steel quality and service to add dollars to your operating profits.

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Steel Mill Products: plates • hot rolled strip and sheet • cold rolled strip and sheet • tin plate • continuous weld pipe • electric weld pipe • alloy and carbon bars • bar shapes • structural shapes • semi-finished steels • pig iron • ingot molds • coke by-products • **Fabricating Division:** steel fabrication for construction, aircraft, missile and other industries • expanded fusion weld pipe • reinforced concrete pipe • tanks • For specifications, write: **KAISER STEEL CORPORATION** • **Los Angeles** • **Oakland** • **Seattle** • **Portland** • **Phoenix** • **Denver** • **Tulsa** • **New York**

will make the deliveries with existing facilities.

Piedmont Natural Gas Co., Inc., Charlotte, N. C., opposed the issuance of the certificate in the absence of a condition requiring that deliveries to Owens-Corning be offered on a basis of equal availability with offers of excess gas to Piedmont and other customers. Piedmont stated Transcontinental's proposed increase was "unduly preferential."

The presiding examiner stated that Transco's filed tariff does not entitle Piedmont "to any part of the interruptible gas available on the system unless and until Transcontinental offers it . . . When such an offering is made the tariff requires that it be made . . . on a non-discriminatory basis and in proportion to their respective contract demands . . . under rate schedules for firm service."

The commission staff counsel said Transcontinental's tariff on file with the commission did not contain any priority of service to the several classes of customers and the staff counsel stated that it appeared appropriate "to have such priority of service specified in the tariff in order that the character of service under the several service classifications is definite and certain."

The presiding examiner concluded that the "record here does not establish that the additional interruptible service . . . will impair Transcontinental's ability to serve Piedmont, or other jurisdictional customers, nor does it justify a finding that the public convenience and necessity require the attachment of such a condition as has been proposed to the certificate . . ." The presiding examiner, however, said that "under a different state of facts it might be that the public convenience and necessity would require the attachment of terms and conditions" to the certificate.

Pennsylvania firm seeks connection to TGT line

Scranton-Spring Brook Water Service Co., Wilkes-Barre, Pa., has filed (Docket G-10251) an application with the Federal Power Commission in which it asks that Tennessee Gas Transmission Co. supply it with natural gas service for distribution in Scranton and Wilkes-Barre.

It proposes to interconnect with the Hebron-Greenwich facilities of TGT and to install and operate approximately 13 miles of 12-in. line to connect to its Scranton division and approximately 24 miles of 12-in. pipe interconnecting the Scranton and Wilkes-Barre divisions. In addition, seven regulating and two metering stations would be installed.

The peak-day demand for the Scranton division for the first year would be 5531 Mcf and for the fifth year, 8.7 MMcf. Peak-day demands in the first year for the headquarters division would be 1360 Mcf and in the fifth, 2411 Mcf.

Scranton-Spring Brook proposes service in Wyoming, Lackawanna, and Luzerne counties, Pa. at an estimated cost of $1.6 million.

Contract let for California expansion

Contract for a 241-mile 30-in. line from Newhall, Calif. to the Colorado River near Needles has been let by Southern California

A Specialized Engineering Service to STOP

NOISE—
—from intake or discharge of air, steam or gas piped to atmosphere.
—from engines, compressors and vacuum systems.

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PULSATION—
— from surges created by compressors, pumps, blowers and pressure reduction systems.

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and Southern Counties Gas companies to R. H. Fulton & Co., Lubbock, Texas.

This line, major portion of the companies' $33.5 million construction project to bring an additional 278.2 MMcf of gas a day into southern California, will cost an estimated $24 million.

A 49-mile line from Newhall to Alhambra, which will connect with the major line, is now under construction, with completion expected by Dec. 1.

So. Counties vice president Grove Lawrence said that Fulton's crews will probably begin initial right-of-way work this month, with actual pipeline work getting under way in January. The line is to be completed and in operation about June 30, 1956, he said.

Pipe for the project is coming from the Provo, Utah plant of Consolidated Western Steel division of United States Steel.

The line will cross mostly undeveloped territory, consisting of desert and mountainous land. In addition to the Colorado, two rivers will have to be crossed. Both are suspension bridges, one a 650-ft span over the Santa Clara river near Newhall and the other a 400-ft span over the Mojave river north of Victorville.

The gas industry's voluntary pipeline construction code, which calls for testing of the line before it is put in use, is being followed by the companies. Natural gas will be used for testing most of the line with water being used on a portion at the western end.

ANOTHER MAJOR PROJECT by

1956
ASSOCIATED PRESS
Gas Company Will Start Big Project Monday
Forty-Man Crew Will be Employed In McAlester Area
Consolidated Gas Utilities Corporation will get started Monday on a major project involving a survey of all distribution lines and installation of magnesium anodes where it is found necessary to arrest pipe corrosion.
The work will require about four months and will provide employment for a crew of about 40 men at the peak of the program, which will represent an overall expenditure of approximately $175,000.
The job has been contracted to Cathodic Protection Service Company, Houston, Tex., which will be in complete charge of the project. Headquarters will be established at the Consolidated warehouse on West Harrison, just off of North Main.
Portions of some streets may be temporarily barricaded
LITTLE TROUBLE — Marilyn Monroe smiles over her shoulder after strap of her dress broke during press conference in New York. Strap was apparently held in place originally by safety pin which can be seen dangling from end of strap. The blonde actress announced she planned to make movie with Sir Laurence Olivier. (NEA Telephoto)

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CPS

A RECENT STORY ON THE FRONT PAGE OF THE McALESTER NEWS CAPITAL, McAlester, Okla.

Through the refinement of known techniques, CPS engineers in charge of the project described in the adjacent news item are not only locating "hot spots" on the gas distribution system for the subsequent application of cathodic protection with magnesium anodes, but they are also pin-pointing the areas where replacements of or repairs to the piping are necessary due to the advanced stage to which corrosion has progressed. Why delay your protection program longer? Call on Cathodic Protection Service's large staff of experienced corrosion engineers to complete *NOW* work you have projected one, two or even more years into the future.

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Idaho co-ops want gas supply from Pacific

Applications by 12 Idaho cooperatives filed with the FPC seek orders directing Pacific Northwest Pipeline Corp. to supply them with gas (Docket G-10576, et al).

The co-ops also seek authority for the construction and operation of natural gas facilities costing approximately $10,750,000.

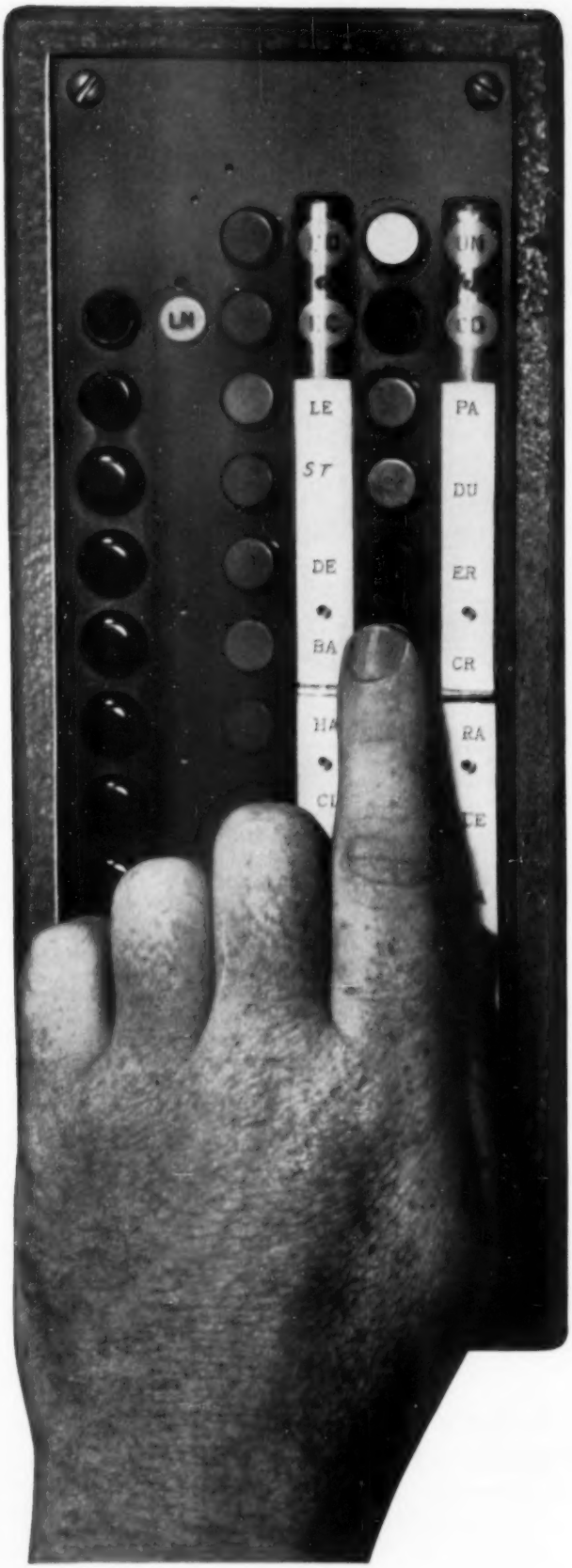
The fifth year peak-day requirements (42,286,000 cu ft) and the cost of the individual facilities, including distribution systems, are as follows: Alameda Cooperative Gas Association, 2,707,000 cu ft, $475,000; Blackfoot Cooperative Gas Association, 2,942,000 cu ft, $460,000; Burley Cooperative, 3,474,000 cu ft, $630,000; Caldwell Co-op, 5,837,000 cu ft, $1,050,000; Idaho Falls Co-op, 8,995,000 cu ft, $3.4 million; Jerome Co-op, 2,091,000, $630,000; Meridian Co-op, 1 MMcf, $250,000; Montpelier, 1,276,000, $260,000; Mountain Home Co-op, 2,239,000, $450,000; Pocatello, 8,989,000 cu ft, $2,230,000; Rupert Co-op, 539 Mcf, $395,000; and Weiser Co-op, 2,197,000 cu ft, $520,000.

El Paso acquires residue gas

El Paso (Texas) Natural Gas Co. will be able to acquire up to 20.2 MMcf/day of residue gas from West Lake Natural Gasoline Co., a wholly owned subsidiary, with authority just granted by the Federal Power Commission (Docket G-10481).

Proposed facilities, estimated to cost $1,004,000, include 28.1 miles of 10-¾-in. line in Nolan and Coke counties, construction of a 1320-hp compressor station at Jameson, a purchase meter station, and appurtenant facilities, all in Texas.

In a supplement to its original



Push-button selector speeds coded data in Gulf Interstate's telemetering system

You are looking at a special push-button private line teletypewriter device developed by the Bell System and used by Gulf Interstate Gas Co.

The company uses the teletypewriter as a recorder in its digital telemetering system, which provides automatic transmission of operating data. Such data includes engine speeds as well as suction and discharge pressures at five remote compressor stations.

The dispatcher in the company's Houston headquarters simply pushes the proper buttons. The selected distant station is instantly on the circuit. Coded telemetered data is then received directly on the teletypewriter in the form of an accurate, easily read record.

This unique selector unit is another example of how equipment developed by the Bell System meets communication needs.

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application, El Paso requested permission to acquire West Lake's 50 per cent interest in processing and gathering facilities proposed to be constructed in Nolan county. These facilities include a natural gasoline absorption plant, a natural gas dehydration plant, a 6600-hp compressor station, and 55 miles of various sized gathering lines.

The overall cost of these facilities is estimated at $4.8 million, of which El Paso proposes to pay one half. The other half will be paid for by certain producing interests. West Lake would act as operator of the facilities.

American Louisiana boosts system capacity

American Louisiana Pipe Line Co., Detroit, has temporary authority from the FPC for facilities estimated to cost $8.7 million and which will increase the company's daily delivery capacity by 60 MMcf.

The authorized facilities—two new compressor stations of 12,000 hp each and the addition of 2000 hp at two already certificated stations—are part of a $16 million construction program designed to increase American Louisiana's daily deliverability from 300 to 400 MMcf.

In addition, the company has requested authority to construct and place in operation by July 1957 two additional stations having 8000 and 10,000 hp respectively. They would raise the daily delivery capacity by 40 MMcf.

American Louisiana requested the temporary authorization in order to prepare for increased demands of existing customers in case the coming winter is colder than normal.

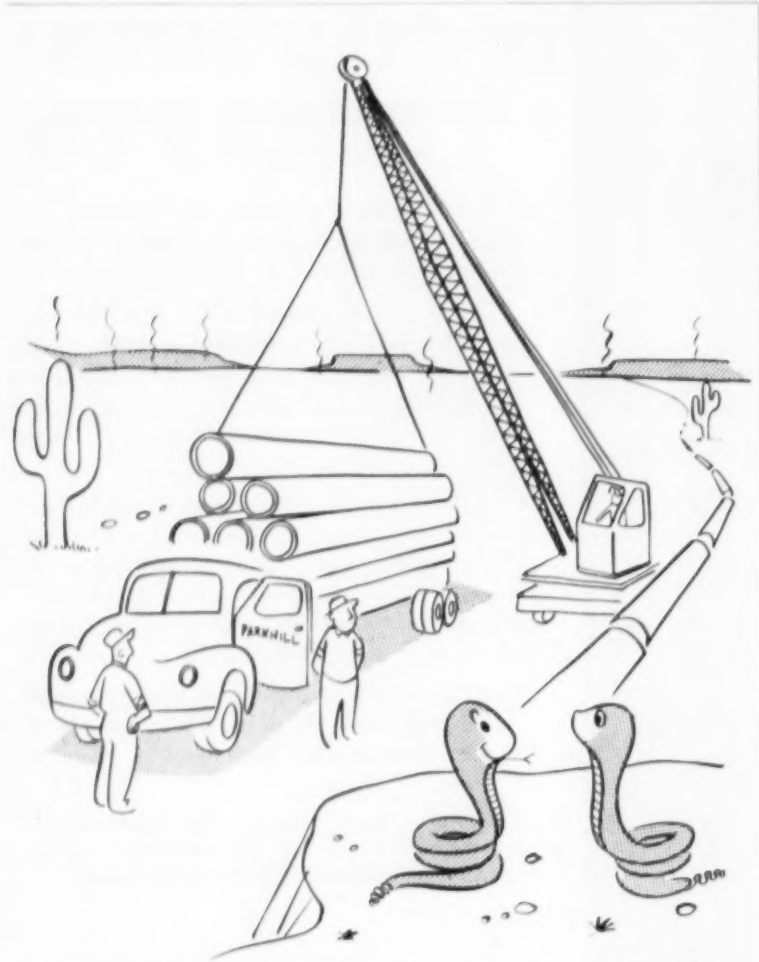
American must submit cost-of-service tariff

Claiming that the company's cost of service "is not sufficiently definitive at this time to support specified unit demand and commodity rates," the FPC rejected American Louisiana Pipe Line Co.'s tariff and directed it to file a new one based on actual cost of service.

Under the rejected tariff, American Louisiana proposed to bill its two Detroit affiliates, Michigan Wisconsin Pipe Line Co. and Michigan Consolidated Gas Co., under a contract-demand two-part rate schedule and on the basis of its estimate that each customer would take its contracted entitlements at 100 per cent load factor.

In its rejection of the tariff, the FPC also said that the claimed costs of service appear excessive and that the proposed contract demand tariff containing specific unit rates does not seem appropriate for the sales to the affiliates for the initial few years of service.

The commission pointed out that the company's presentation of costs in support of its tariff reflected only a single year's operation at estimated annual capacity. However, the FPC said, American Louisiana plans to increase its capacity by one third as early as next month. (The company has received partial okay of this plan —installation of additional compressor stations and increased capacity at two existing stations.) According to the commission, this pending application indicates anticipated earnings significantly in excess of the 6 per cent rate of return claimed in its tariff sub-



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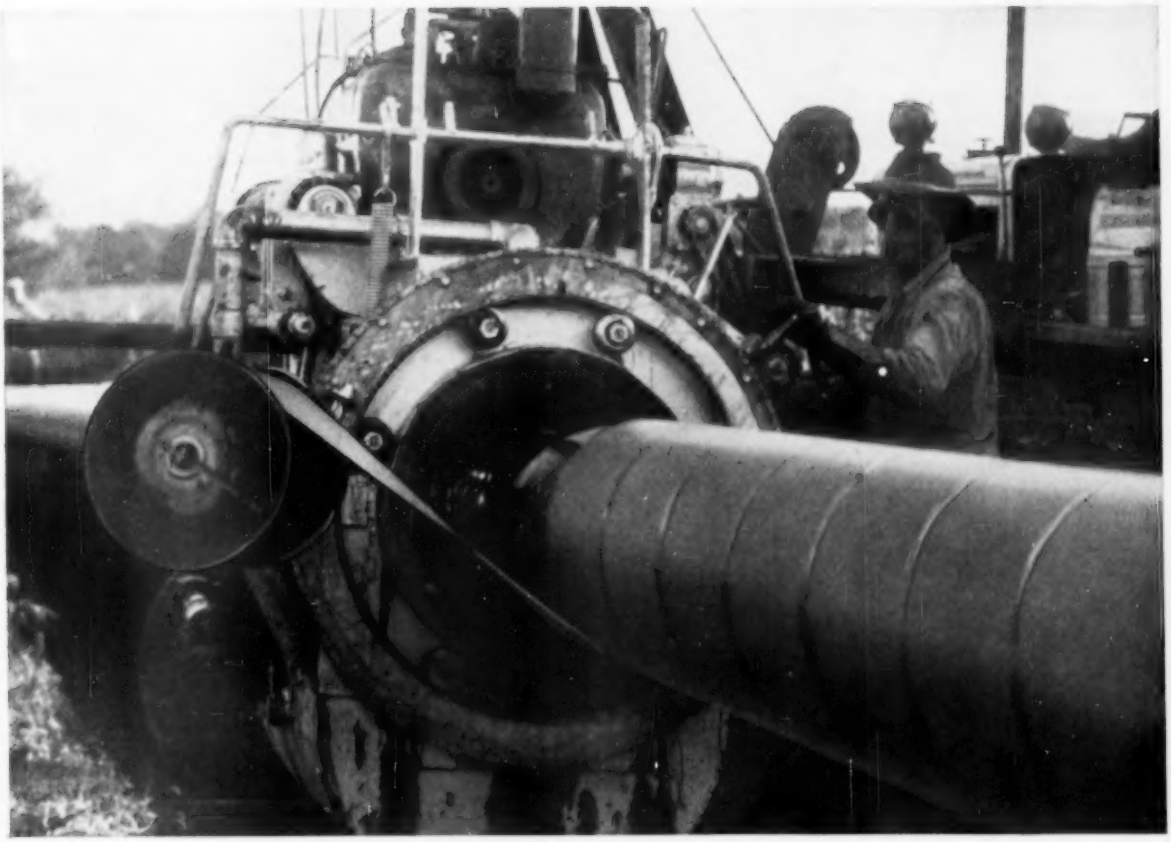

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mitted June 11. The FPC also said that certain specific items in the cost of service submitted in support of the proposed tariff "appear excessive and unreasonable."

A cost of service type of tariff is necessary and proper for the initial few years of service, the commission said, to protect American Louisiana if costs increase before higher rates can be made effective, and to protect the public against excessive rates during the period required to properly determine costs of service and to effect rate reductions. In addition, the FPC said, under the cost of service type of tariff, the two affiliated customers will pay only for the costs actually incurred, not estimates of costs.

FPC affirms, modifies Continental Oil order

The Federal Power Commission has affirmed a presiding examiner's decision issuing certificates to Continental Oil Co., Houston, for sales of natural gas to United Gas Pipe Line Co., Shreveport, and denying Continental's petitions for declaratory orders that the sales are not subject to FPC jurisdiction.

The commission modified the examiner's decision authorizing specific facilities. Rather than authorizing the continued operation of any facilities necessary for the sales as found by the examiner, the commission concluded that in Continental's particular operations "certificates are required at least for the lengths of pipe from the separators to the points of interconnection with the lines of United and for a field compressor which is used to facilitate the movement of gas from two wells into the lines of United."

The commission said that certificates are required for those facilities which "clearly appear to be facilities which serve the function of effecting sales of natural gas in interstate commerce . . . for resale."

In reference to Continental's petitions the commission said "that the jurisdictional aspect of this case can be decided upon the single question whether Continental's sales to United are 'sale(s) in interstate commerce of natural gas for resale' within the meaning of . . . The Natural Gas Act."

The commission said that the record established that there is an uninterrupted flow across a state line of some or all of the gas sold and delivered by Continental to United under the parties' contracts. Continental's sales, the FPC stated "are subject to our jurisdiction and Continental is a 'natural gas company' under Section 2" of the Act.

The certificates cover sales which Continental makes to United from the Slick-Wilcox, Albercht, Boyce, South Weesatche, Cabeza Creek, and South Cabeza Creek gas fields, in Goliad and DeWitt counties, Texas.

Presiding Examiner Glen R. Law filed his decision on March 8 ruling that Continental "not only sells gas in interstate commerce but owns and operates facilities necessary to such sales."

Commissioner Seaborn L. Digby filed a separate concurring statement objecting to any reference to the producer's facilities, for the same reasons set forth in his separate opinions issued with the FPC's previous orders issuing certificates to independent producers.

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Companies seek $60 million for construction jobs

Two gas companies have asked the Securities and Exchange Commission for permission to raise a total of more than $60 million to finance construction projects.

Consolidated Natural Gas Co., New York, is seeking to register with SEC $30 million of 25-year debentures to be offered for public sale at competitive bidding. Proceeds will be used to repay about $20 million in short-term bank notes used to finance this year's construction program, and the rest will finance additional construction and other activities.

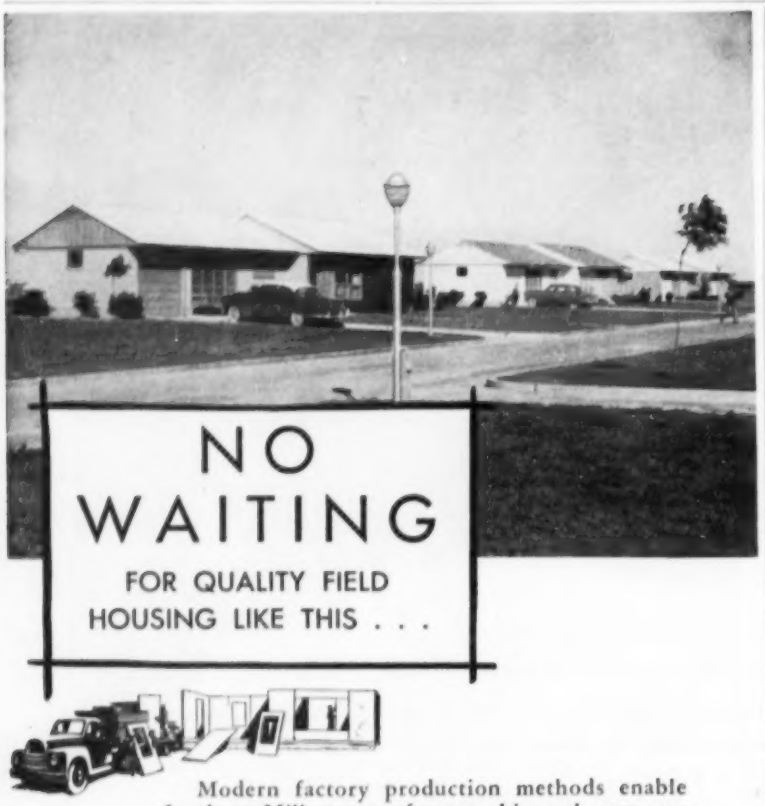
A new pilot and airplane have joined the Somerville Construction Co., Ada, Mich., to speed transportation between farflung construction jobs. Here Pilot Mike Uramkin (with hat) welcomes Bob Wagner, area construction supervisor, aboard for a flight to Detroit for a consultation concerning 30 miles of 16-in. line for Consumers Power.

American Louisiana Pipe Line Co., Detroit, is asking SEC for authorization to borrow between now and next July 1 up to $28 million. Some $12 million will be used to complete initial development of the firm's pipeline from Louisiana to Michigan. Remainder will be used to finance expansion of the initial pipe by 100 MMcf/day if it is approved by the Federal Power Commission.

Texas plans appeal in gathering tax judgment

The State of Texas has laid plans to appeal a $2,658,953 judgment awarded El Paso Natural Gas Co. in an aftermath of the invalidation of the natural gas gathering tax law three years ago.

Judge J. Harris Gardner of the 53rd district court held that the company is entitled to the amount, plus interest, even though the company paid the tax without any formal protest. The judge said he was guided by a decision made a year ago by Judge Jack Roberts of the 126th district court in a suit brought by the Tennessee Gas Transmission Co. In this suit, TGT was awarded a judgment to recover $1,140,906 paid on the tax



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without written protest. That case is now before the Supreme Court.

About $6 million is reportedly involved in taxes collected from the transmission companies under the outlawed gathering tax law, and the Texas legislature next January must face the problem of providing funds for the court judgments.

Settlement reached in Northern's rate case

Settlement was reached in the rate proceedings involving Northern Natural Gas Co., Omaha, when the FPC approved a move which will result in a reduction of more than $2 million per year in the amount of an increase the company is now collecting subject to refund.

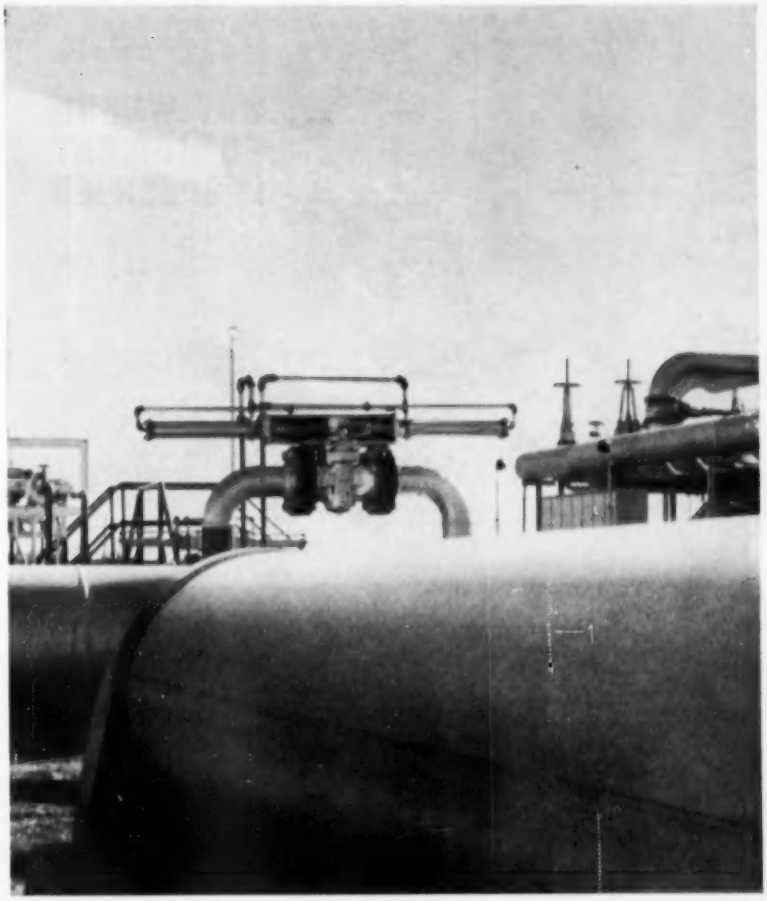
Northern, when it filed its rate increase in July 1954, proposed to increase its wholesale rates to some 31 customers by approximately $8.1 million per year. This increase was suspended by the FPC pending hearings and decision, but it went into effect, subject to refund on Dec. 27, 1954. A year later Northern reduced the amount of the increase by about $2 million annually to reflect a decrease in its claimed cost of service.

The new settlement permits Northern to increase its rates above those in effect prior to Dec. 27, 1954 by slightly more than $4 million, with the exact amount depending on the final disposition of appeals by Northern and others in a proceeding involving the question of whether Northern must establish rate zones.

The FPC in May 1955 ordered the company to divide its system into three zones with different rates for each, but the company and some of its customers appealed from this ruling to the U. S. court of appeals. The court, after granting Northern's request for a partial stay of the FPC's order, issued a decision affirming the commission. However, there has not yet been any indication of whether further appeals are planned or of the immediate disposition of the stay order.

Gas revenues reached $2.6 billion in 1955

Gas operating revenues of natural gas companies filing annual reports with the FPC totaled $2,633,069,000 for the year 1955, and sales of natural gas by the companies amounted to 8.39 trillion cu ft. One



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New AGA Code Revision Specifies Emergency Shutdown Facilities...

"Each transmission compressor station shall be provided with an emergency shutdown system by means of which all gas compressing equipment, all gas fires, and all electrical facilities in the vicinity of gas headers and in the compressor building can be shut down and the gas can be blocked out of the station and the station gas piping blown down." (per Paragraph 843.431, Emergency Shutdown Facilities, Revision of Section 8 of ASA B31.1).

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pipeline news • *Cont'd.*

hundred eleven such companies were in operation during 1955, but mergers during the year reduced the number to 109 at year's end.

Sales of natural gas and revenues from such sales reported by the companies for 1955 amounted to 6.73 trillion cu ft and $1,780,177,000, respectively, representing increases of 8.0 per cent in sales and 16.2 per cent in revenues, over sales of 6.23 trillion cu ft and revenues of $1,532,030,000 in 1954. In keeping with the character of the companies, 80.3 per cent of their 1955 sales — 5.40 trillion cu ft — were made to other natural gas companies for resale. Revenue from such sales, $1,495,209,000, were equal to 84.0 per cent of total revenues from all gas sales. Total gas operating revenues of the companies, including revenues from transportation of gas of others, revenues from sales of products extracted from natural gas, and "other natural gas revenues," totaled $1,881,517,000 during 1955, an increase of 17.8 per cent, over the $1,597,090,000 received in 1954.

Gas operating revenue deductions, including charges for operations and maintenance and provisions for depreciation and taxes, amounted to $1,575,401,000 for the year, and in relation to revenues improved slightly over 1954—84.2 cents per revenue dollar in that year to 83.7 cents in 1955.

Mountain Fuel's tie-in with Pacific okayed

Temporary authority has been granted to Mountain Fuel Supply Co., Salt Lake City, to build pipeline facilities to enable it to take 58,750 Mcf/day from Pacific Northwest Pipeline Corp. for delivery to distribution areas in southwestern Wyoming and Utah.

In a concurrent action, the FPC granted temporary authority to Pacific to build metering facilities for the sale of the gas to Mountain Fuel. It also gave temporary authority to Pacific to make peak-day deliveries of 117.5 MMcf to Colorado Interstate Gas Co.

The new source of supply will increase Mountain Fuel's capacity to 285 MMcf/day and will enable it to meet its estimated firm peak-day requirements for the coming two winter seasons of 247 MMcf and 275 MMcf.

Court upholds FPC in Panhandle cases

Two decisions upholding the action of the Federal Power Commission in cases involving Panhandle Eastern Pipe Line Co. have been rendered by the 3rd circuit court of appeals.

In one case, Panhandle sought review of an FPC order which denied the company's application to reduce service to Michigan Consolidated Gas Co. In this case, Panhandle contended that the FPC's action was barred by principles of *res judicata* in that prior FPC orders had determined Panhandle's obligation to Michigan Consolidated. The FPC's order was affirmed, the court holding that the doctrine *res judicata* can have no application to a proceeding involving present or future convenience and necessity with respect to continuance or abandonment of service.

In the other case, Central West Utility Co. and Missouri Power & Light Co. sought to have Panhandle directed to increase deliveries. The court affirmed the FPC, holding that it might exact of Panhandle only maintenance of existing facilities to their original design or actual capacity.

North Dakota to appeal gas price controversy

North Dakota's Public Service Commission will take the controversy involving the Tioga-Williston pipeline to the federal circuit court of appeals.

The state agency had sought an investigation by the FPC of gas contracts involving the line. However, the commission denied the state's application on the grounds that gas sold from the line in four North Dakota communities is not in interstate commerce and therefore is not a matter of federal jurisdiction.

Charles Murphy, legal counsel for the state commission, said the commission had instructed him to appeal the FPC denial on the premise that "discrimination and prejudice" in gas prices exist to consumers in the communities of Epping, Wheelock, Springbrook, and Ray.

The pipeline, built and operated by Montana-Dakota Utilities Co., with gas obtained from Amerada Petroleum Corp. and Signal Oil & Gas Co., connects at Williston with

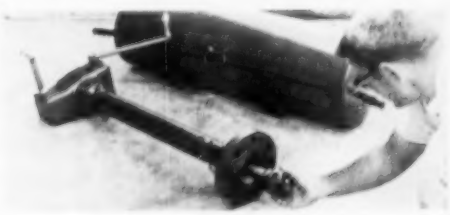
1,200 MILES OF PROGRESS
WITH RUGGED EQUIPMENT
FOR
AMERICAN LOUISIANA PIPE LINE COMPANY

30" Main Line

FROM THE GULF COAST TO THE GREAT LAKES . . .

WmSON PIGS THOROUGHLY CLEANED NEW SECTIONS OF LINE DURING CONSTRUCTION AND DISPLACED HYDROSTATIC TEST WATER.

AMERICAN LOUISIANA TESTING CREW UNDER BILL CLARK (INSET) FIELD SUPT. FROM LEFT TO RIGHT: L. L. ENGLAND, R. F. LEPPIC, H. L. WAITERS, L. E. CLIFFORD, B. E. SAVELY AND R. H. FORTNEY.



BRANCH "HOT TAPS" ARE MADE QUICKLY AND SAFELY WITH WmSON-HILLCO **HIGH-PRESSURE** TAPPING MACHINES.

Field service was provided throughout the project by an experienced WmSon service engineer.

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MDU facilities leading into Montana.

The line came under the FPC's jurisdiction as a result of the interstate connection of facilities and earlier this year FPC granted Montana-Dakota a permanent certificate to operate the line. The North Dakota commission took exception. Prior to that, however, the state commission had asked the FPC to investigate gas price contracts between MDU and Amerada and Signal. The PSC alleged discrimination in charging the four communities 16 cents per Mcf for gas that is served to Williston and the East Fairview area near Williston for 9 cents.

The FPC held in that action that since the gas originated within North Dakota, the price of gas served the four communities was not an interstate matter. On this the state commission asked a rehearing, denied by the FPC.

Explaining that the state commission's attitude is that the FPC "has attempted to narrow the scope of its hearing after learning facts of this discrimination," Attorney Murphy said, "The North Dakota commission does not intend to stand idly by and permit floor rate levels for native natural gas in North Dakota to be set by a technical reading of the federal law. The (PSC) commission feels duty bound to bring this matter before the courts."

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in

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IN THE AIR (BRIDGES)

- *J. W. Sharman*
- *John Gay*
- *S. A. Taylor*

Sharman-Allen-Gay & Taylor

- 3115 BUFFALO DRIVE
- HOUSTON, TEXAS

Big Piney's gas flows into Pacific's line

Pacific Northwest Pipeline Corp. officers and representatives of field producers turned a valve recently which set in flow the first cubic foot of gas from the 18-year-old Big Piney oil and gas field in Big Piney, Wyo.

Pacific's chairman, Ray Fish, and vice chairman, C. R. Williams, joined with Arthur B. Belfer and David C. Bintliff of Belco Petroleum Corp. to turn on the jointly owned compressor station. This station is the highest major transmission company station in America, standing 7325 ft above sea level. With gas from the San Juan basin, the Big Piney gas was the first to flow into Pacific's new transmission lines.

It is estimated that Big Piney's reserves will approximate three-fourths trillion cu ft of gas by the end of the current drilling program this year.

Under terms of two long-life contracts, PNW will take approximately 50 MMcf of gas per day from the field during the first year. After the completion of additional compressor and transmission facilities, within one or two years, the take will be increased to from 75 to 100 MMcf/day. The contracts call for a total take of 750 billion cu ft during a 20-year period.

GAS pipeline notes

Washington (D. C.) Gas Light Co. plans to build 28.8 miles of line in Virginia to increase gas supplies in its Virginia service area and support supplies for the District of Columbia and Maryland (Docket G-10090). About 26 miles of 24-in. line will run from the metering station of Atlantic Seaboard Corp. near Dranesville, Va. to a point near Washington where it will con-

nect with a new 2-mile line leading to the District of Columbia facilities.

Rhodia Inc., New York, has appointed Comerciale Reka S.A. as sales and technical representative for synthetic aromatic chemicals and compounds and Alamask industrial re-odorants in Mexico. The company headquarters in Mexico City. Also appointed was Luis Felipe, Havana, as sales and technical representative for these products in Cuba.

Recently approved plans of Cities Service Gas Co., Oklahoma, will result in construction and operation of 11.77 miles of 30-in. replacement line; 17 miles of 20-in. loops in Logan county, and the addition of turbocharging equipment to two 1100-hp compressor units in its Edmon station in Oklahoma county (Docket G-10520).

The FPC has instituted investigations of gas rates charged by The California Co., New Orleans, and Union Oil Co. of California, Los Angeles, to determine whether any of those subject to FPC jurisdiction fall into the "unjust, unreasonable, unduly discriminatory, or preferential" category. The companies sell gas to Texas Gas Transmission Corp. They propose to charge a rate of 21 cents/Mcf, which, the order states, is among the highest in Louisiana and represents the highest price paid by Texas gas for field purchases.

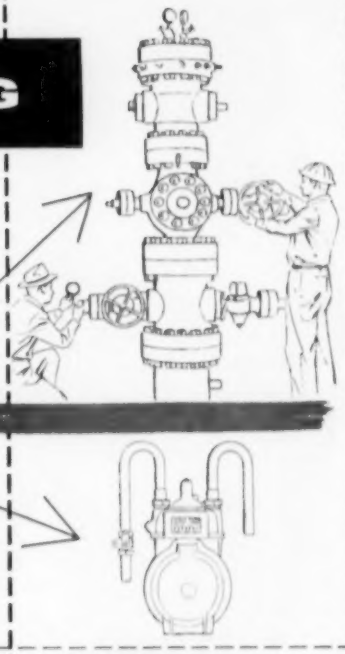
Construction will start soon on another new Transite asbestos-cement pipe plant at Denison, Texas, according to A. R. Fisher, president of Johns-Manville Corp. Other plants included in the $40 million Transite pipe expansion program are under construction or in operation in Stockton, Calif.; Marrero, La.; Waukegan, Ill.; Watsonville, Calif.; and Manville, N. J.

Funds for the expansion and modernization of General Electric Co.'s small steam turbine department in Fitchburg, Mass., have been increased some $1.9 million and now total $3.1 million. The new appropriation covers expenses for additional testing facilities, production machine tools and apprentice training machine tools, a 6000-sq ft shop extension, and a new building to be used for preparation of coatings, and rearrangement of factory and office facilities.

TITRILOG

. . . to control sulfur compounds and odorants all the way from here

. . . to here



Sulfur compounds at the wellhead . . . *bad*. Sulfur compounds (such as mercaptans) at the consumer's end of the line . . . *a must*. Consolidated's TITRILOG helps control them at every step of the way . . . from purchase and sale of raw gas clear through to monitoring the odorants metered into consumer distribution systems for safety purposes.

An automatic, around-the-clock instrument, the TITRILOG provides an accurate, *continuous* record of oxidizable sulfur concentrations. It is an invaluable help in controlling corrosion by monitoring treated gas before it enters transmission lines. As a double check, it is also widely used to monitor gas in transit and to ensure that H_2S concentrations are within contract limits.

For the complete story of CEC's TITRILOG, send today for Bulletin CEC 1810C-X8.

Both the stationary Model 26-102 (left) and the portable Model 26-103 (below) TITRILOGS are continuous, and highly sensitive, offer a wide range and instantaneous response. Both models report sulfur-compound concentrations as low as 0.1 ppm or 0.005 grains per 100 cubic feet. Compounds of specific interest may be separately determined.

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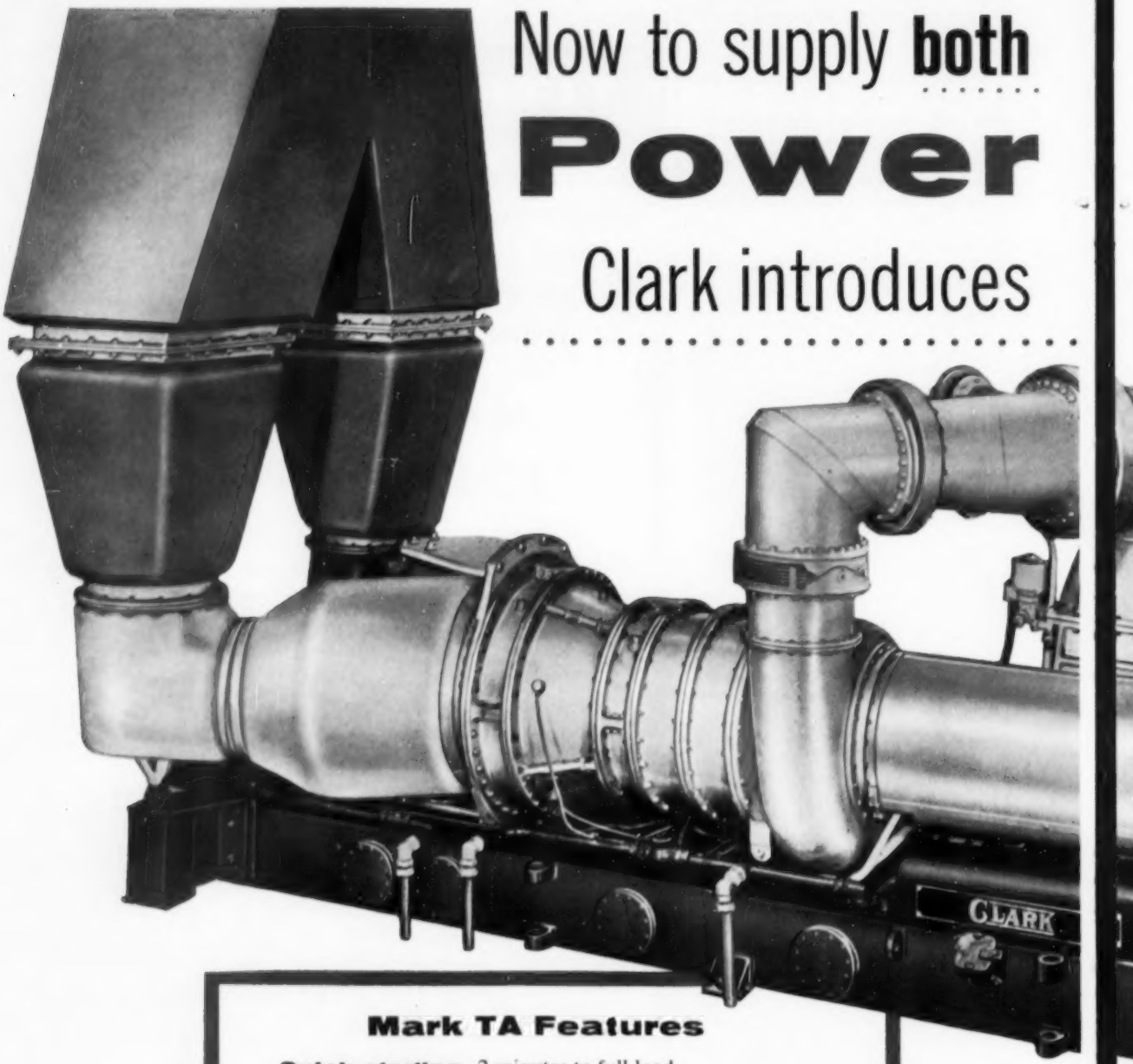

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Compact—only 16′ long, portable
Long life—conservative blade temperatures
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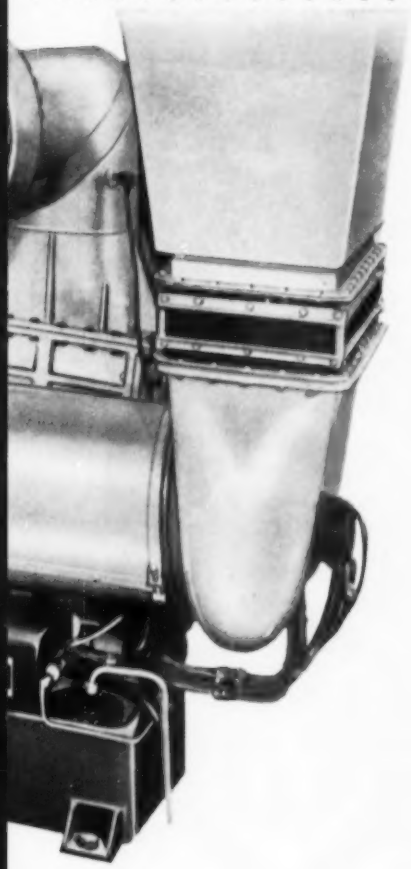
Fuel versatility—liquid or gaseous
Installation flexibility—up or down duct connections
Variable speed—physically separated turbines
Single combustion chamber—lasts a lifetime

and **Steam**

the **Mark TA** Gas Turbine



Power to drive a generator, pump or centrifugal compressor and low or high pressure steam for process use . . . the new Clark Mark TA 1130 bhp gas turbine will do both when equipped with a waste heat boiler. In addition to the 1130 bhp of rotative energy the turbine-boiler package will deliver 9500 lbs. of steam per hour at a combined fuel utilization of up to 79%. It's the most modern, compact and efficient power plant combination you can install!

The new turbine is also well suited to driving rotative loads without a waste heat recovery system. Its light weight, compactness and quiet, practically vibrationless operation makes it ideal for marine or portable use as well as for permanent installation.

Your nearest Clark representative will be pleased to give you all the facts about Clark gas turbines in sizes to 8500 bhp, or write for bulletin 142.

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Experience can keep you out of trouble in fighting corrosion, too.

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Since 1941, TAPECOAT, the quality coal tar coating in handy tape form, has demonstrated its ability to withstand corrosion year after year. In case after case, TAPECOATed lines have been dug up after 10 years of service *with no signs of deterioration on the pipe surfaces uncovered.* That's why TAPECOAT is specified by those who know that continuing protection is the first consideration.

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GAS progress reports

NEW CONSTRUCTION PLANNED

CHICAGO DISTRICT PIPELINE CO., Joliet, Ill. Docket G-10549 for 14.1 miles of 36-in. line from terminus of existing Howard Street line in Elk Grove, Ill., to a point on northerly city limits of Chicago.

CURRENT CONSTRUCTION

ALBERTA GAS TRUNK LINE CO. LTD., to build 130-mile gathering line near Edmonton-Bonnie Glen line south to Calgary; 80-mile line to Bassano, and 130-mile line to Saskatchewan boundary to gather and move gas to meet Alberta's requirements and export needs of Trans-Canada Pipe Lines Ltd. 1956 construction includes 16 miles of 18-in. pipe and 18 miles of 34-in. to connect the Bindloss field with western terminus of Trans-Canada's lines.

ARKANSAS LOUISIANA GAS CO., Shreveport. Docket G-2307 for 134 miles of 6⅝- to 24-in. line in 11 sections, and 10,500-hp compressor station on its system in Arkansas, Louisiana and Texas. Compressor station and 71 miles of line completed.

COLORADO INTERSTATE GAS CO., Colorado Springs. Docket G-2121-(1956 program) 239 miles of 22-in. line from Laramie, Wyo. to connection with Pacific Northwest Pipeline Corp. line at Green River, Wyo. R. H. Fulton will start two spreads April 15. Nov. 1 completion schedule delayed due to late pipe delivery.

MICHIGAN WISCONSIN PIPE LINE CO., Detroit. Docket G-2327 for approximately 251.9 miles of 24-, 18-, 12-, 6-, and 4-in. loops and 3400 hp additional at existing compressor stations in Illinois. Gabe Construction Co. at work on 46.8 miles of 4- and 6-in. loops in Iowa and Missouri; Houston Contracting Co. and H. C. Price at work on 141.7 miles of various sizes in Illinois and Wisconsin; 63.4 miles of 4- and 6 in. loops remain to be contracted for.

PACIFIC GAS & ELECTRIC CO., San Francisco. Midwestern-Johnson-Dixon at work on 85-mile, 34-in. line paralleling Super Inch from Topock, Ariz. to Milpitas, Calif. Other contractors at work on 6620-hp additions at Topock and Kettleman compressor stations.

PERMIAN BASIN PIPELINE CO., Omaha. Dockets G-9688 and 9724. For 19-mile, 16-in. line and 6750-hp compressor station in Andrews county, Texas, to take gas from Phillips gasoline plant. Gasoline Plant Construction Corp. Houston building compressor station; R. H. Fulton the line.

SOUTHERN CALIFORNIA and SOUTHERN COUNTIES GAS CO., Los Angeles. To build 236-mile, 30-in. line from Newhall, Calif. to Topock, Ariz. on Colorado river to meet El Paso Natural line from San Juan and Permian basins. Also three 1760-hp

Now under construction: West Coast Transmission Line

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compressors at Topock, R. H. Fulton & Co., Lubbock, Texas, has contract for line. Initial work to begin this month. Scheduled for completion in June, 1957.

TEXAS GAS TRANSMISSION CORP., Owensboro, Ky. Docket G-8828 for 189 miles of line and 19,190 hp in compressor capacity along its system in Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, and Indiana. Contracts for 10,820 compressor hp let to Longview Equipment Co. and 7500 hp to Ford, Bacon & Davis. Compressor construction begun. Work completed on 9.2 miles of pipe, contracts let on remainder to Houston Contracting Co., Williams Brothers Co., and Union Construction Co.

TRANS-CANADA PIPE LINES LTD., for 2250-mile gas line taking Alberta gas from Alberta - Saskatchewan border to Toronto and Montreal, with lateral from Winnipeg to Emerson, Man., 34-in. line from Alberta border to Winnipeg under construction, 30-in. from Winnipeg to Toronto; 24- and 20-in. from Toronto to Montreal; 24-in. from Winnipeg to Emerson; 10 compressor stations totaling 105,000 hp. First four sections of line under contract to Majestic Contractors Ltd., Mannix Ltd., Canadian Bechtel Ltd., and Dutton-Williams Brothers. As of July 31, 131 miles of row cleared and graded and 56 miles of pipe strung.

WESTCOAST TRANSMISSION CO. LTD., Calgary. To build 650-mile, 30-in. line from Peace river area to near Vancouver, B.C., to connect with line of Pacific Northwest Pipeline Corp., to transport 370 MMcf daily, of which 300 MMcf is to be delivered to PNW. Work has commenced on all four sections between Peace river and International Border. Scheduled for completion in fall of 1957.

APPROVED

CITIES SERVICE GAS CO., Oklahoma City. Docket G-10520 for 11.7 miles of 30-in. replacement line; 17 miles of 20-in. loop in Logan county; and addition of turbocharging equipment to two 1100-hp compressor units in its Edmond station in Oklahoma city, to add 250 hp to each unit.

EL PASO (TEXAS) NATURAL GAS CO. Docket G-10481 to install 28.1 miles of 10¾-in. line in Nolan and Coke Counties, Texas; install new 1320-hp compressor station at Jameson.

CONTRACTS LET

NORTHERN NATURAL GAS CO., Omaha. Dockets G-2399, et al. for 654 miles of line and an additional 12,640 hp in compressor capacity. Also 15-mile 24-in. line from Ogden, Iowa to underground storage near Redfield; 168-mile 20-in. from Twin City area to Duluth and Superior; 92-mile 12-in. and 71-mile 10-in. line in South Dakota and 307 mile of branch lines. Compressor additions and 15-mile line to test Redfield storage project approved. Contracts for compressors and line let to H. B. Zachary, Dresser Engineering Co., Foor Engineering Co., R. H. Fulton & Co., and Pentzien Inc.

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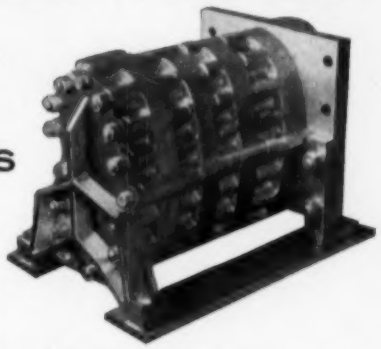

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GAS pipeline people

DR. GEORGE S. HUME, well known geologist who has been director general of Scientific Services for the Department of Mines at Ottawa, has joined Westcoast Transmission Co. Ltd., Vancouver, B.C. as vice president and chief geologist.

WALTER H. FELDMAN, executive vice president of Worthington Corp., Harrison, N. J. has been elected a member of the board of directors. With Worthington since 1944, Mr. Feldman has been executive vice president since January 1955.

JAMES G. WALKER has succeeded CHARLES T. DEARBORN as northeastern regional sales manager for the Johns-Manville Pipe Division. The regional office has been transferred from Boston to New York.

ROGER D. STANWOOD has been elected vice president-gas supply of Transcontinental Gas Pipe Line Corp., Houston. Mr. Stanwood joined Transco in 1951 as assistant to the vice president in charge of gas supply. Transco has also announced the promotion of R. K. ANDERSON to assistant personnel director.

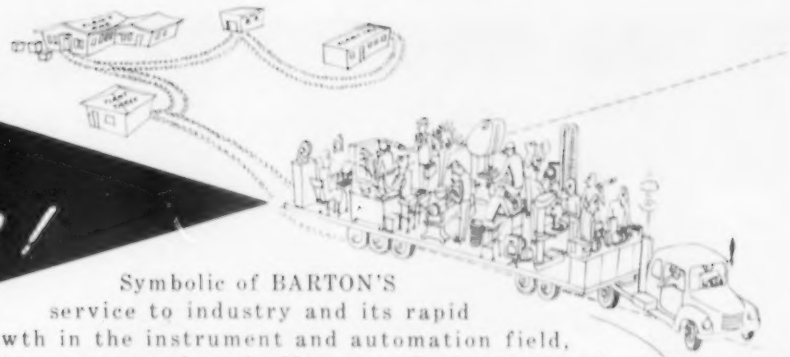
L. L. WHITENECK has been elected vice president and appointed director of corrosion control and material research of Plicoflex Inc., Los Angeles. For the past 10 years Mr. Whiteneck has been senior harbor engineer for the Long Beach (Calif.) Harbor Department, in charge of testing and evaluation of coating materials and the economics of corrosion design.

Kaiser Steel Corp., Oakland, Calif., has named HARRISON H. HANCE advertising manager. He

R. D. Stanwood
Transco

L. L. Whiteneck
Plicoflex

BARTON *on the move!*



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Experienced sales engineers representing BARTON, are located in most principal cities. The Barton line is fully described in literature available upon request.

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Pipe Bending Problems?

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Lighter . . . Faster . . . More Compact. Easily transported on float truck without removal of tracks. Two sizes 16" through 30"; 22" through 36".

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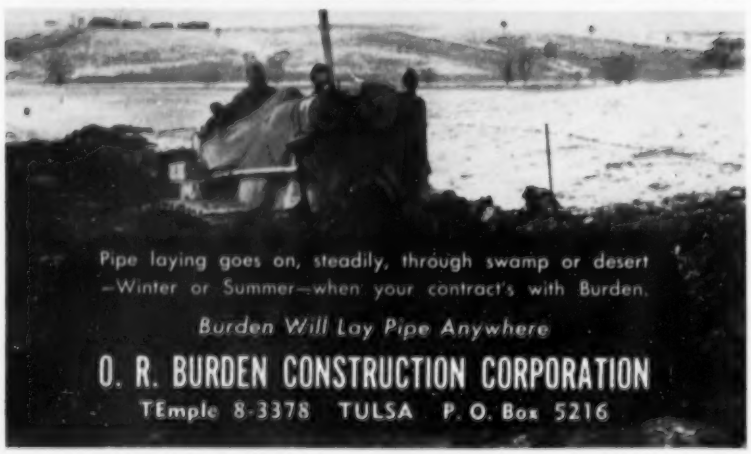
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pipeline people • *Cont'd.*

E. S. McRoberts
Beaird

W. W. Sentell
Beaird

joined Kaiser in 1954 as administrative assistant to the vice president in charge of advertising and publications. Kaiser also announced the appointment of HARRY L. WARNER as sales manager for the Fontana (Calif.) fabricating division and JACK H. SMITH as director of the air control and research department of the same division.

E. S. MCROBERTS, who has been manager of compressor sales for the past 10 years, has been promoted to staff consultant of the general sales department of the J. B. Beaird Co. Inc., Shreveport. W. W. SENTELL succeeds him as manager of compressor sales.

C. R. HARTMAN, 49-year-veteran with Cooper-Bessemer Corp., Mt. Vernon, Ohio, has retired. The veteran service engineer arrived in Oklahoma in 1906 to begin his career repairing and maintaining compressor machinery for the Cudahy Oil Co. Within the year he joined the Bessemer Gas Engine Co., predecessor to the Cooper-Bessemer Corp.

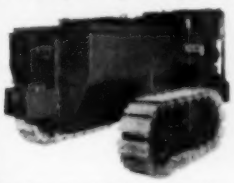
JOHN V. BANKS has been named production manager of Kaiser Steel Corp.'s fabricating division, Montebello (Calif.) plant.

Consolidated Electrodynamics Corp., Pasadena, Calif., has appointed PHILIAS H. GIROUARD assistant director of engineering. He was formerly chief engineer of the U. S. Navy Bureau of Ordnance. CEC has also named JOHN J. MCDONALD as assistant director of the systems division.

DAMON HOLDITCH has been appointed district manager of the new south Louisiana exploration district office of Lone Star Producing Co., Dallas. Headquarters of the new office are in Lafayette, La.

CROSE—LITTLEFORD
MODEL 211-10-P2
PIPE LINE KETTLE

For transporting on highway



For tough pipeline terrain

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pipeline people • *Cont'd.*

JOHN COCHRAN succeeds Mr. Holditch as district manager in the south Texas district office at San Antonio.

Two new administrative assistant positions have been created by Parkhill Truck Co., Tulsa. HOWARD C. GOODEN, formerly secretary and manager of the Mid-States Equipment of Denver, is administrative assistant with duties and responsibilities primarily in public relations and job development. M. J. MACKIE, superintendent and projects manager for Parkhill for several years is an administrative assistant serving chiefly in a liaison capacity in the field.

H. C. Gooden
Parkhill

M. J. Mackie
Parkhill

Walter Messner
Bristol

S. E. Gewin
Bristol

Bristol Co., Waterbury, Conn., has named S. E. GEWIN district manager of the Chicago office and WALTER MESSNER to succeed him as manager of the St. Louis office. Mr. Gewin has been with the Bristol sales organization since 1937. Mr. Messner joined Bristol in 1940 and has been regional field engineer in Tulsa since 1943.

H. H. OLDHAM has been named director of advertising for Republic Steel Corp., Cleveland. He succeeds CHESTER W. RUTH, who has retired.

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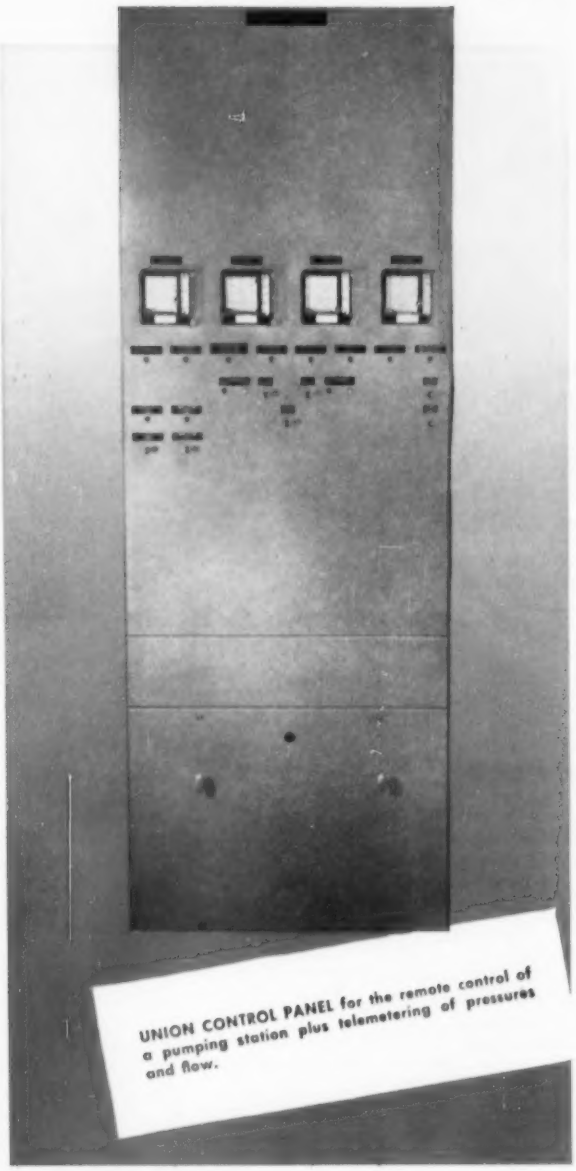

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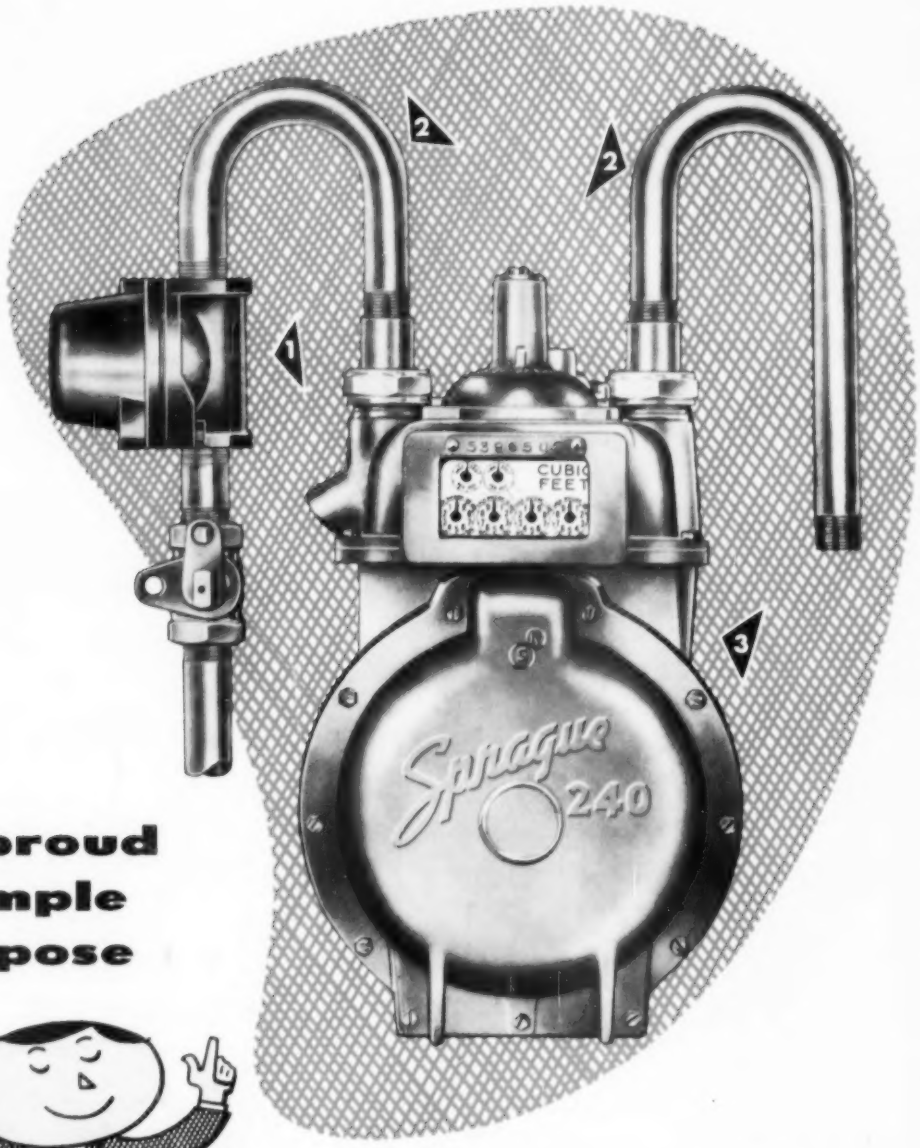

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